



## **Abstracts and Posters**



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***Note: All information was correct at the time of publication***



**Category:** Trauma

**ID:** 11143

## Evaluating the Accuracy of the Orthopaedic Eye

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Orthopaedic operations frequently involve the manual manipulation of two objects in space relative to each other. Most surgeries are still dependent on the human factor and more specifically the human eye (in this case the “orthopaedic eye”) to gauge the end result. Thus the planned result (the science of surgery) and the final surgical result (the art of surgery) may differ at times. Our hypothesis was that the human eye would not be able to distinguish any angular difference less than three degrees from the planned trajectory.

#### **Methods**

A cross sectional study in the form of an online survey was conducted. Five clinical scenarios (each with seven variations), that require judgment of intra-operative angles, were recreated using X-rays with angles drawn on them using the Picture Archiving Software tools. A total of thirty-five yes or no statements were tested. Results were collected and analysed statistically.

#### **Results**

A total of seventy-four respondents completed the survey. The mean responded age was 42.8 years (SD 11.2, range 28-80). Average years in practice as a doctor (but not yet a specialist) being 8.3 years (SD 2.1, range 4-11) and the median number of years after qualifying as an orthopaedic surgeon being 9.0 years (interquartile range, 5.0–17.5). The highest frequencies of inaccuracies occurred around the 1° error margin for all scenarios. Although specialists appeared to score higher ( $66.6 \pm 7.3\%$ ) than trainees ( $62.9 \pm 11.4\%$ ), this difference was not significantly different ( $p=0.107$ ).

#### **Conclusion**

Orthopaedic surgeons can distinguish alignment differences of less than three degrees if the reference framework is perfectly orthogonal and parallel. If the reference framework is rhomboid (skewed) then gauging angles of less than three degrees off the reference frame, especially if on the acute side of the rhomboid reference frame, becomes more inaccurate - an angular perception ‘blind spot’.



**Category:** Foot & Ankle

**ID:** 11145

## **Assessment of Imaging, Pathoanatomy and Terminology in Posterior Tibial Tendon Dysfunction**

**Paper/Poster:** Paper

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### **Submission:**

#### **Introduction**

This study aimed to determine damage/change occurring in the posterior tibial tendon of patients undergoing surgery for posterior tibial tendon dysfunction (PTTD) and to correlate preoperative imaging and intraoperative findings with histology to determine the most appropriate investigations for diagnosis. The secondary aim was to clarify terminology used in describing the tendon pathology to improve descriptive terminology when researching, assessing, and treating PTTD.

#### **Methods**

Folders of patients who had undergone surgery for stage 2 PTTD were retrospectively reviewed. Cases in which preoperative diagnostic imaging was done and a posterior tibial tendon specimen was sent for histology were included. Results of ultrasound (US), MRI, surgical notes and histopathological reports were evaluated.

#### **Results**

Nineteen patients met inclusion criteria. Fourteen had US showing degenerative changes and synovitis. Five had MRI showing tendon degeneration and rupture in two cases. Intraoperatively, all tendons showed gross abnormality, with surrounding synovitis. Microscopically, no acute inflammation was noted within any tendon specimens. All had non-specific reactive changes within the visceral synovium.

#### **Conclusion**

This study confirms clear histological degeneration within the posterior tibial tendon of patients undergoing corrective surgery for PTTD. Preoperative imaging and surgical findings identified tendon sheath synovitis. Pre-operative ultrasound imaging and intraoperative confirmation of PTTD is accurate, thus histological confirmation is unnecessary. The pathological changes in PTTD have been described as a tendinopathy in the literature. We suggest using the term pantendinopathy, which is a combination of peritendinitis with tendinosis, as it better describes the pathological process.



**Category:** Oncology

**ID:** 11147

## The Surgical Management of Metastatic Lesions of the Femur

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Malignant tumours commonly metastasize to bone. When this occurs in the femur, surgical intervention is required to reduce pain and restore mobility post fracture, or as a prophylactic measure when fracture is anticipated. This is typically in the form of replacement with hemi or total arthroplasty or stabilization with an intramedullary device. The indications for one modality over the other are debatable and reported outcomes and complications are varied. The purpose of this study is to assess the management algorithm for bony metastasis of the femur at a tertiary bone tumour unit, and the outcomes of the surgical strategies employed.

#### **Methods**

A retrospective cohort study was performed of all patients presenting with femoral metastasis, both with and without pathological fracture, who were managed surgically from April 2016 to February 2020. Data was recorded regarding demographics, primary pathology, location of lesion, type of surgery and implant used, and the incidence of complication.

#### **Results**

85 femurs in 77 patients were included (mean age 61, range 20-90). Lesions were located in the femoral neck (19/85), intertrochanteric (20/85), sub-trochanteric (40/85), diaphyseal (2/85) and metaphyseal/per-codylar (4/85) regions of the femur. 64/85 procedures were performed for fractures and 21/85 prophylactically. 18/85 underwent long-stemmed cemented bipolar hemiarthroplasty, 1/85 long-stemmed cemented THR, 62/85 cephalomedullary nailing, and 4/85 retrograde femoral intramedullary nailing. Mean follow-up was 8 months (range 1-36). There were no dislocations or peri-prosthetic fractures in the arthroplasty group. One failure (1/66, 1.5%) of fixation occurred intramedullary nailing group. Six deaths occurred in the arthroplasty group (6/64, 9.4%) and 24 in the nailing group (24/66, 36.4%) during the study period. Four patients suffered from thromboembolic phenomena (4/77, 5.2%). All 13 patients who sustained a pathological fracture which were managed with intramedullary nailing and followed up for at least one year had achieved clinical and radiological union.

#### **Conclusion**

Femoral metastasis can be appropriately managed with intramedullary nailing, both prophylactically and in the event of fracture, with an expectation that healing will occur once stabilised. Intracapsular fractures can be managed with long-stemmed cemented arthroplasty with a low risk of subsequent fracture or dislocation.



**Category:** Current Topics (COVID-19)

**ID:** 11148

## **The Impact of COVID-19 on the Clinical Exposure of Undergraduate Medical Students during Orthopaedic Block Rotation; Our Experience at the Sefako Makgatho Health Sciences University**

**Paper/Poster:** Paper

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### **Submission:**

#### **Introduction**

The purpose of this paper is to report the impact of the COVID-19 pandemic and the national lockdown restrictions had on musculoskeletal training and clinical exposure of final year medical students, rotating through the orthopaedic surgery department of the Sefako Makgatho Health Sciences University (SMU), in Pretoria, South Africa.

#### **Methods**

A retrospective attendance review (1 April to 30 June 2020) of the current final year students whose departmental rotation was disrupted due to the national lockdown (COVID group) was conducted. Their attendance was compared with the previous year's final year students (non-COVID group) who had uninterrupted lectures at our department during the same timeline. These two groups were statistically compared using appropriate statistical tests for normally distributed data and not normally distributed data. The condition for statistical significance was set at  $p < 0.05$ .

#### **Results**

Due to the national lockdown, the COVID group attended 13 days of rounds, while the non-COVID group attended 15 days. The overall attendance of the COVID group, at different clinical settings, was significantly less ( $p < 0.0001$ ) compared to the non-COVID group. To compensate for the disrupted face-to-face lectures, the students in the COVID group, were supplemented with online lectures. The total lectures attended by the



COVID group (online + face-to-face) was still significantly ( $p < 0.001$ ) less than the lectures attended by the non-COVID group.

**Conclusion**

This study has demonstrated a significant decline in musculoskeletal training and clinical exposure of final year medical students. Although this may only manifest later when this group go into practice, medical education sector should explore novel avenues and innovations in clinical training, even during disease outbreaks.



**Category:** New Research in Orthopaedics (Research concept; Proposal; idea)

**ID:** 11149

## **Defining the Anatomic Axis Joint Centre Distance (aJCD) and Anatomic Axis Joint Centre Ratio (aJCR) of the Distal Femur in the Coronal Plane**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

The aim of this radiographic study was to define the anatomical axis joint centre distance (aJCD) and anatomical axis joint centre ratio (aJCR) of the distal femur in the coronal plane for skeletally mature individuals.

#### **Methods**

A cross-sectional radiographic study was conducted to calculate the horizontal distances between the anatomical axis and the centre of the knee at the level of the intercondylar notch and the joint line. Ratios relating these points to the width of the femur were then calculated.

#### **Results**

A total of 164 radiographs were included: 91 male (55.5%) and 73 female patients (44.5%) with a mean age of  $44.9 \pm 18.0$  years, with 79 right (48.2%) and 85 left (51.8%). The intercondylar width mean was  $75.4 \pm 6.8$ mm, the median aJCD at the notch was 3.6mm (interquartile range, IQR 2.1 – 5.1), the median aJCD at the joint line was 4.7mm (IQR 3.5 – 6.3), the aJCR at the notch  $45.1 \pm 2.7$ , and the aJCR at the joint line  $43.5 \pm 2.7$ . The intercondylar width was significantly different ( $p < 0.001$ ) between males ( $79.5 \pm 5.0$  mm) and females ( $70.4 \pm 5.1$  mm). A significant difference between the aJCR at the notch ( $p=0.003$ ) and the aJCR at the joint line ( $p=0.002$ ) was observed in males and females. No differences between the aJCD at the notch or aJCD at the joint line was observed between males versus females, left versus right and those younger versus those older than 65 years.

#### **Conclusion**

This is the first objective description of the anatomic axis joint centre ratio (aJCR) of the distal femur in the coronal plane. This ratio can be used to aid the planning and execution of distal femoral deformity correction, retrograde femoral nailing, and total knee arthroplasty.



**Category:** Foot & Ankle

**ID:** 11151

## **Syndesmosis Injury in Professional Rugby Players in South Africa: Treatment and Return to Play. A Retrospective Cohort Study between 2015-2019.**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Syndesmosis injuries are common and increasing in contact sports with a marked impact on both players and teams due to prolonged and often unpredictable return to pre injury level. We aim to evaluate the current treatment algorithm and return to play after syndesmosis injuries in a cohort of professional male rugby players, treated by a single surgeon, for the period between July 2015 to July 2019.

#### **Methods**

All professional rugby players treated for syndesmotic injuries both operative and non operative by the senior author with a minimum follow-up period of 12 months or until return to play. Players with previous ankle injuries or associated injuries of the tibia or fibula were excluded. Outcome measures included the time taken for return to practice and return to play.

#### **Results**

For the period July 2015 to July 2019 a total of 13 male rugby players from the South African Sevens team and the Western Province Stormers team were included, of which two athletes presented with a recurrent syndesmotic injury. Mean time to return to play was 107.33 days with (SD 59.84) average time it took to return to first match was 119.2 days (SD 60.29).

#### **Conclusion**

Professional rugby players treated for syndesmosis injuries are able to return to play however the duration can be unpredictable and prolonged.



**Category:** Trauma

**ID:** 11152

## **Paediatric Distal Radius Fractures: Risk Factors for Re-Displacement**

**Paper/Poster:** Paper

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**Type:** REGISTRAR

### **Submission:**

#### **Background**

Re-displacement of paediatric distal radius fractures is a common problem that may require surgical intervention to forfend suboptimal functional outcomes. Several individual risk factors are known to increase the risk for re-displacement. The aim of this study was to explore specific risk factors for re-displacement of the distal radius after closed reduction and plaster cast immobilization.

#### **Methods**

A retrospective cohort study included paediatric patients between the ages of 2 - 14 years who presented with distal radius fractures and underwent closed reduction and plaster cast immobilization. Data was evaluated for patient related, fracture related and treatment related risk factors for re-displacement. Quantitative predictor variables were individually tested against the outcome of re-displacement of the fracture using an independent T-test whilst the Mann Whitney U test was used for non-normally distributed data. A Chi-squared test was used to detect associations between categorical predictors and the outcome of re-displacement. A p value < 0.2 was used to select independent variables to take forward into a multivariable log binomial model. The final model was determined using forward selection and included only predictors with p-values < 0.05.

#### **Results**

Re-displacement occurring in 40% (n = 59) of the 146 included patients. Independent factors associated with increased risk for re-displacement included: age < 10 years (p=0.002), sagittal plane angulation < 20 degrees (p=0.114 ), a first cast index of > 0.8 (p=0.002), metaphyseal fractures as opposed to growth plate injuries (p= < 0.001), the absence of an associated ulna fracture (p=0.026), and poor initial reduction (p= < 0.001). Three independent multivariable predictors remained in the model to predict risk of re-displacement; poor reduction (RR 2.5 p < 0.001), metaphyseal fracture location (RR 2.6 p=0.029) and first cast index > 0.8 (RR 1.3 p=0.019) showed increased risk for re-displacement while all other factors were held constant.



**Conclusion**

Poor reduction, metaphyseal injuries and a cast index of greater than 0.8 have an increased association with re-displacement of distal radius fractures in children. Identifying risk factors for re-displacement is crucial to the treatment strategy. If the above risk factors are identified, we suggest k wire fixation as opposed to plater cast immobilization to avoid re-displacement.



**Category:** Trauma

**ID:** 11153

## **Validation of the RUST Scoring System for Diaphyseal Femur Fractures Treated by Intramedullary Nailing: Interobserver and Intraobserver Reliability**

**Paper/Poster:** Paper

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

The Radiographic Union Score for Tibia (RUST) fractures has been validated in multiple studies for the assessment of healing in tibia fractures. Subsequently other authors have utilised the scoring system for other long bone fractures. Our objective was to validate the RUST for the assessment of healing in diaphyseal femur fractures treated by intramedullary (IM) nailing by measuring the interobserver and intraobserver reliability.

#### **Methods**

A total of 60 sets of anteroposterior (AP) and lateral radiographs of diaphyseal femur fractures treated by reamed IM nailing were randomly selected from the HIV in Orthopaedic Skeletal Trauma (HOST) database. The 60 sets of radiographs were then scored by 3 reviewers using the RUST system. Interobserver agreement was measured at initial scoring. The 60 sets of radiographs were scored again by the 3 reviewers to calculate the intraobserver agreement.

#### **Results**

The RUST scores ranged from 4 to 12 with a mean score of 11.3. The interobserver intraclass correlation coefficient (ICC) was 0.87 (95% CI, 0.81-0.92) indicating almost perfect agreement. The intraobserver ICC was 0.91 (95% CI, 0.88-0.94) also indicating near perfect agreement.

#### **Conclusion**

This study demonstrated that the RUST system can be used as a reliable scoring tool in the assessment of healing in diaphyseal femur fractures with almost perfect interobserver and intraobserver reliability.



**Category:** Trauma

**ID:** 11154

## **Retrospective Case Series on the use of Novosorb Biodegradable Temporizing Matrix (BTM) used as Wound Coverage on Trauma Patients Treated in Gauteng Based Hospitals.**

**Paper/Poster:** Paper

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**Co-Author 1 Institute :** Charlotte Maxeke Academic Hospital

**Type:** no

### **Submission:**

#### **Introduction**

Trauma, in South Africa, is defined as a “malignant epidemic” with high-energy trauma being synonymous with significant soft tissue damage. Open fractures, extensive degloving injuries with exposed bone, muscle, tendons and significant flame burns are often as a result to high energy trauma.

South Africa is a middle-income country, with rural district hospitals being deficient of trauma surgical services as well as other medical specialty service.

The management of significant soft tissue injuries remains a challenge for the clinician.

NovoSorb Biodegradable Temporising Matrix is an entirely synthetic dermal matrix formed by utilising NovoSorb biodegradable polyurethane foam. We review its use with subsequent split thickness skin grafting for soft tissue defect management.

### **Methods**

#### **Participants**

Trauma patients treated in Gauteng based hospitals with significant soft tissue defects not amenable to primary closure or other difficulties (inadequate staffing/facilities). Informed consent was ascertained from the patient if older than 18 years or by an guardian if younger.

#### **Method**

Selected patients were debrided and under the surgeon’s discretion, had BTM implanted in the first or subsequent sittings. Negative pressure wound therapy used if available, given intravenous antibiotics, exposed and reviewed as per hospital protocol. Once BTM was pink with capillary refill time less than 2 seconds, they were taken to theatre for delamination and grafting.

Patient outcomes were followed up in clinic. Medical records were used to ascertain medical information. X-rays were taken off the hospital database with clinical pictures being taken intraoperatively and clinic visits.

### **Results**

BTM placement and subsequent skin grafting was successful in achieving durable and cosmetic definitive coverage in most defects treated. A few complications such as wound dehiscence was encountered in massive wounds with subsequent prolonged out-patient healing.



**Conclusion**

Complex soft tissue defects can be managed with acute BTM application with delayed split thickness skin grafting. This can potentially lessen the need for flap coverage and be a more cost-effective alternative in a resource constrained country.



**Category:** Arthroplasty

**ID:** 11155

## **Current Perspectives of South African Orthopaedic Surgeons to the Direct Anterior Approach in Total Hip Arthroplasty**

**Paper/Poster:** Paper

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### **Submission:**

#### **Introduction**

Despite the global increase in popularity for the use of the direct anterior approach (DAA) for total hip arthroplasty (THA), the current beliefs and reasons for its use and disuse amongst South African orthopaedic surgeons is not well understood.

#### **Methods**

We conducted an anonymous online survey sent to all current members of the South African Orthopaedic Association to determine the perspectives regarding DAA compared to other surgical approaches to THA.

#### **Results**

The response rate was 24.25% (n=194). There were 76 (39.18%) respondents that have performed DAA (DAA Performers) and 118 (60.82%) that have never performed DAA (DAA Non-performers). A proportion of 50% and 11.84% of DAA Performers were between 30 to 45 years and older than 60 years of age, respectively ( $p < 0.000$ ). The DAA is the preferred approach to THA for 36.84% (n=28) of DAA performers, whilst 63.16% (n=48) prefer an alternative approach. Both DAA Performers who prefer DAA and those who prefer alternative approaches consider DAA more satisfactory for length of hospital stay ( $p < 0.000$ ) and short term functional outcomes ( $p=0.002$ ) compared to other surgical approaches. For DAA Non-performers, the primary reasons for not performing DAA THA was inexperience in surgical technique (72.09%), increased operative time (12.79%), unsatisfactory outcomes (27.91%) and learning curve (67.44%). There were 5 (18.52%) and 30 (70.33%) surgeons who have been in clinical practice for more than 10 years that do and do not intend to use DAA in the future, respectively ( $p < 0.000$ ).

#### **Conclusion**

The trends of the adoption of the DAA by South African orthopaedic surgeons show increasing popularity, similar to patterns seen in the United Kingdom and the United States of America. Younger surgeons are more likely to perform the DAA THA whilst more experienced surgeons are less likely to deviate from their current standard of practice.



**Category:** Current Topics (COVID-19)

**ID:** 11156

## **Drastic Reduction of Orthopaedic Services at an Urban Tertiary Hospital during COVID-19. Lessons for the Future Response to this Pandemic.**

**Paper/Poster:** Paper

**Presenter:** Michael Held

**Presenter Institute :** University of Cape Town

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**Type:** no

### **Submission:**

#### **Introduction**

The COVID-19 pandemic has impacted the global surgery landscape. The aim of this paper was to analyze and describe the initial impact of the COVID-19 pandemic on orthopaedic surgery in a tertiary academic hospital in South Africa.

#### **Methods**

The number of orthopaedic surgical cases, outpatient clinic visits, wards admissions, bed occupancies and total in-patient days for January to April of 2019 (pre-COVID-19), was compared with the same time frame in 2020 (COVID-19). The COVID-19 timeframe included the initiation of a national 'hard lock-down', from 26 March 2020, in preparation for an increasing volume of COVID-19 cases.

#### **Results**

April 2020, the time of the imposed hard-lockdown, was the most affected month, although the number of surgical cases started to slowly decrease in the three months prior. The total number of surgeries (55.2%), outpatient visits (69.1%) and ward admissions (60.6%) decreased significantly in this month when compared to April 2019 ( $p < 0.05$ ). Trauma cases were reduced by 40% in April 2020.

#### **Conclusion**

COVID-19, and the associated lock-down, has heavily impacted both the orthopaedic inpatient and outpatient services. Lockdown led to a larger reduction in the orthopaedic trauma burden compared to international centres, but the overall reduction of surgeries, outpatient visits and hospital admissions was less. This was likely due to local factors, but also a conscious decision to avoid total collapse of our surgical services.



**Category:** Oncology

**ID:** 11157

## **Radiation Induced Pathological Fractures of the Proximal Femur: A Case Series Considering an Endoprosthetic Solution**

**Paper/Poster:** Paper

**Author :** Jonathan Vogel

**Author Institute :** Dept of Health

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Radiation induced pathological fractures of the proximal femur are difficult to treat due to frequent non-union and hardware failure using standard fracture fixation techniques. This case series investigates endoprosthetic replacement as a treatment option.

#### **Methods**

A retrospective folder review of patients from a private hospital in Cape Town, who had sustained a radiation induced pathological fracture, was reviewed using descriptive statistics. Institutional ethical review board approval was obtained prior to data collection (ethical approval number HREC 889/2019)

#### **Results**

Six patients met the inclusion criteria. One patient was excluded as the minimum follow-up time of 6 months was not met. Of the five patients that were analysed, all five sustained transverse, subtrochanteric femur fractures. Prior to definitive treatment with a proximal femoral replacement three patients were treated with standard trauma instrumentation prior to referral to the unit and one patient was treated with a vascularized fibular graft as their initial treatment while at the unit. One patient was treated with an endoprosthetic replacement as their first procedure at the unit. Amongst the three patients treated with standard trauma fixation and the one patient treated with a vascularised fibular graft, there was a 100% failure rate. One standard trauma instrumentation patient had an ablation due to free musculocutaneous flap failure and periprosthetic infection after endoprosthetic replacement. This was the only complication of endoprosthetic replacement. At a median follow-up of 15 months (Min 7, Max 55) the median MSTS score was 73.5% (Min 63%, Max 93%).

#### **Conclusion**

This case series seeks to highlight the high failure rates seen when treating this condition with standard trauma instrumentation or biological methods. Further research is needed, but endoprosthetic replacement may be a viable alternative solution.



**Category:** Paediatrics

**ID:** 11159

## Femoral Lengthening in Children

**Paper/Poster:** Paper

**Author :** Anria Horn

**Author Institute :** Red Cross Children's Hospital and Maitland Cottage Hospital

**Co-Author 1:** Maria Sipilä

**Co-Author 1 Institute:** Kymenlaakson Keskussairaala Hospital, Helsinki, Finland

Type: no

Submission:

Introduction

We evaluated the outcomes following femoral lengthening by distraction osteogenesis in children. Additionally, we determined the incidence and nature of complications, the management thereof and factors associated with the development of complications.

Methods

A retrospective review was performed of all patients who underwent femoral lengthening as an isolated procedure at our institution. Data regarding presenting details and clinical course were collected and X-rays analysed. The Healing index (HI) and the percentage lengthened were calculated. Complications were defined as deep sepsis, joint contracture, fracture and neurological injury.

Results

Fifteen patients underwent 16 femoral lengthenings from 2008-2018. Nine patients had congenital short femur or proximal focal femoral deficiency, 3 patients had sequelae of meningococcaemia and 4 had various other pathologies. The median age at time of surgery was 9 years (6-13). Median follow-up was 1.6 years (0.5-6.6). The median HI was 32 days/cm (20-60). Leg lengths were equalized to  $\leq 2.5$ cm in 11 patients, length achieved was as planned in all but 3 patients.

Eight patients sustained fractures on average 6 days (2-57) after frame removal, 5 were through the regenerate. Four required surgery. Thirteen patients developed joint contractures and 6 required additional procedures to address this. Two deep infections required surgery. Two patients developed neurological symptoms of which one recovered fully.

Higher percentage length gained ( $> 20\%$ ) was associated with increased fracture and joint contracture rate.

Diaphyseal osteotomy, as opposed to metaphyseal, was associated with increased risk of fracture (71% vs 25%). A diagnosis of congenital short femur was associated with increased fracture rate.

Spanning the knee did not prevent joint stiffness in 4/5 patients but did prevent subluxation.

Conclusion

Femoral lengthening using external fixation can be successful in achieving leg length equality but complications are common and often require additional surgery. Limiting lengthening to less than 20% of the original bone length and performing the osteotomy through the metaphysis decreases the risk of fracture and joint contracture.



Category: Paediatrics

ID: 11160

## **Predictors of Early Recurrence Following High Tibial Osteotomy for Infantile Tibia Vara.**

**Paper/Poster:** Paper

**Author :** Anria Horn

**Author Institute :** Red Cross Children's Hospital and Maitland Cottage Hospital

**Co Author 1 :** Visasalv Boskovic

**Co-Author 1 Institute :** University of Cape Town

**Type:** no

### **Submission:**

#### **Introduction**

Recurrence of deformity following high tibial osteotomy (HTO) for infantile tibia vara (ITV) is common. The purpose of this study was to identify risk factors for recurrent deformity following HTO for ITV and to develop a simple scoring system to quantify the risk of recurrence in each patient.

#### **Methods**

We identified 69 patients with 102 affected limbs undergoing HTO for ITV from 2005 to 2015. Demographic and radiographic data was collected. On pre-operative radiographs we measured the mechanical varus angle (MVA), the condyle-shaft angle (CSA), the plateau depression angle (PDA), the metaphyseal-diaphyseal angle (MDA) and the mechanical lateral distal femoral angle (LDFA). On the post-operative radiographs, we measured the MVA and MDA only. We classified each limb according to the Langenskiold and LaMont classifications. Statistical analysis was performed to identify variables predictive of recurrent deformity and these variables were analysed to develop a scoring system to quantify risk of recurrence following HTO.

#### **Results**

Of the examined variables, age older than 4.5 years, an MVA of more than 23° and a LaMont type C deformity were predictive of recurrent deformity. The incidence of recurrent deformity increased from 14.3% with no risk factors, to 91.3% with 3 risk factors present.

#### **Conclusion**

Advanced deformity and age above 4.5 years at the time of surgery predicts recurrent deformity following HTO for ITV. Surgery should be performed as soon as possible and caregivers should be counselled appropriately regarding risk of recurrence and the need for future surgery.



**Category:** Infection

**ID:** 11161

## **The Management of Chronic Osteomyelitis in Adults. Outcomes of an Integrated Approach.**

**Paper/Poster:** Paper

**Author :** Rudolph Grobler Venter

**Author Institute :** Division Orthopaedic Surgery, Stellenbosch University

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**Co-Author 3 Institute :** Division Orthopaedic Surgery, Stellenbosch University

**Type:** no

### **Submission:**

#### **Introduction**

This study presents the outcomes of the management of chronic osteomyelitis of the appendicular skeleton according to an integrated approach at a dedicated bone infection unit at Tygerberg Hospital.

#### **Methods**

We performed a retrospective record review of cases seen at our unit between January 2016 and December 2018. Eighty patients were identified who were treated for chronic osteomyelitis at our unit using an integrated approach.

#### **Results**

Sixty patients (75%) presented with fracture related infections, 17 patients (21.25%) developed chronic osteomyelitis following haematogenous spread and 3 (3.75%) from contiguous wounds. According to the Cierny and Mader classification, 21 patients presented with anatomical type I, 14 with type II, 24 with type III and 21 with type IV chronic osteomyelitis. Positive microbial cultures were obtained in 63 (78.75%) cases. Follow up for the cohort ranged from 1 to 29 months, with a mean follow up of 10.4 months. The overall complication rate for the cohort was 6.25% and included sterile drainage from the surgical site after management with bioactive glass (S53P4), refracture after hardware removal, and development of non-union. Five patients experienced recurrence after the initial procedure to eradicate infection, resulting in an overall resolution rate of 93.75%.

#### **Conclusion**

Using single stage surgeries and tailored dead space management strategies according to a comprehensive integrated approach developed in South Africa, results comparable to international literature can be achieved.



**Category:** AI & the future of Orthopaedics

**ID:** 11162

## **Two Years of Orthopaedic 3D Printing at Tygerberg Hospital. Growing Pains and Future Directions.**

**Paper/Poster:** Paper

**Author :** Rudolph G Venter

**Author Institute :** Stellenbosch University

**Type:** no

### **Submission:**

#### **Introduction**

In 2018 we founded our own clinician-run 3D Printing laboratory in the Division of Orthopaedic Surgery in collaboration with the Institute of Biomedical Engineering (IBE) at Stellenbosch University. In the lab our unit has used 3D Printing to produce models based on the CT or MRI imaging data of patients with complex orthopaedic conditions. The models are used to plan and rehearse the surgical procedures using the instruments and trial implants that will be used in theatre.

#### **Methods**

Recently 3D printing has become much more affordable due to a decline in the price of the hardware and the software. Through equipment grants from the University of Stellenbosch we acquired two Filament Deposition Modelling (FDM) printers and, using mostly open source software, we started producing models based on the CT and MRI imaging requested for pre-operative planning. This new accessibility, combined with the intuitive knowledge that having a 3D printed model of the patient's anatomy will aid their understanding of the pathology, has led us to investigate the place of this technology in daily practice and training.

#### **Results**

We present an introduction to medical 3D Printing for orthopaedic surgeons, followed by a description of the process involved in the creation of a model based on a patient's medical imaging and a series of cases illustrating different uses. Also, we highlight the lessons that we learnt in the last two years about what the technology can and can't do.

#### **Conclusion**

Manufacturing our own models of patient anatomy for planning and rehearsal has the potential to have a big impact on the way we practice Orthopaedics. Our surgeons should have a basic understanding of the underlying technology and realistic expectations about what it can offer as it becomes more readily available.



**Category:** Trauma

**ID:** 11163

## **Early Clinical Outcomes of Gunshot Isolated Fibular Fractures Treated Non-operative at an Urban Academic Hospital**

**Paper/Poster:** Paper

**Author :** Collen Nkosi

**Author Institute :** university of the Witwatersrand

**Co-Author 1:** Mangaliso Maseko

**Co-Author 1 Institute :** Charlotte Makexe Johannesburg Academic Hospital

**Co-Author 2:** Allan Sekeitto

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**Co-Author 3:** Susan Van deventer

**Co-Author 3 Institute :** university of the witwatersrand

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Isolated fibular shaft fractures are a relatively uncommon type of long bone fracture and secondary to direct trauma and gunshot injuries. Gunshot injuries of the fibular are commonly managed non-operatively with antibiotics, irrigation, cast immobilisation, wound care and had high union rates. Tibia fractures are commonly associated with fibular diaphyseal fractures due to the forces transmitted through interosseous membrane to the fibula. Non-operative treatment of low velocity gunshot trauma was previously reported with low rate of infection. The aim of our study was to establish the outcomes of gunshot isolated fibular fractures that were treated non-operatively.

#### **Methods**

Our study is a retrospective review of patients who had gunshot isolated fibular fractures that were treated non-operatively with antibiotics at Charlotte Maxeke Johannesburg Academic Hospital between 01 June 2017 and 31 May 2020. Outcome measures were: infection and union. All participants were adults above 18 years old, who had gunshot injuries resulting in Isolated fibular diaphyseal fracture with an intact tibia. Fractures were classified using the orthopaedic trauma association (OTA) classification system for diaphyseal segment fibula fracture -4F2.

#### **Results**

A total of 35 cases were reviewed from medical records to have 15 isolated fibular gunshot fractures and of the 15 identified cases, three were excluded due to operative management. A total of 12 cases were finally included with 11(91.7%) males and 1(8.3%) female and an average age of 36.4 years. Sixty-seven per cent of the injuries involved the right-hand side and 33% on the left-hand side. The mean length of hospital stay was 4.2 days. Union was achieved by 91.7% (n = 11) patients, all (100%) patients had good soft tissue results, and identified complications included non-union, synostosis and nerve injury.

#### **Conclusion**

All isolated fibular shaft gunshot wounds healed with no infection with the intravenous antibiotic treatment instituted and good fracture union was observed. Our study supports the intervention of treating low velocity isolated fibular shaft gunshot fractures non-operatively.



**Category:** Trauma

**ID:** 11164

## **A Computer Tomography Based Anthropomorphic Study of Forearm Osteology. Implications for Prosthetic Design.**

**Paper/Poster:** Paper

**Author :** Henry Sean Pretorius

**Author Institute :** Stellenbosch University

**Co-Author 1:** Nando Ferreira

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**Co-Author 2:** Marilize Burger

**Co-Author 2 Institute :** Stellenbosch University

**Type:** no

### **Submission:**

#### **Introduction**

Purpose: The aim of this study was to accurately establish the variability in the anatomy of the radius and ulna in the context of the design of an intramedullary nail for both bones.

#### **Methods**

Forearm computed tomography scans were used to measure the specific internal and external anatomy of the radius and ulna in adult patients. Patients with fractures or dislocations involving either the radius and/or ulna were excluded.

#### **Results**

A total of 97 scans, comprising 84% male and 16% female patients, were included. The mean radius length was  $238.43 \pm 18.38$  mm (95% CI 234.60 - 241.74mm). The mean curvature was an arc with a radius of  $561.43 \pm 93.49$ mm (95%CI 543.09-580.78mm). The canal widths smallest measurement was 5.17mm (95%CI 4.87-5.47mm). The ulna showed a mean length of  $259.90$ mm  $\pm 19.88$  (95%CI 255.89-263.91mm). The canal widths smallest measurements being  $4.80$ mm  $\pm 1.30$  (95%CI 4.53-5.87mm). The mean proximal shaft angle was  $11.39^\circ \pm 3.30^\circ$  (95% CI 10.76-12.82°).

#### **Conclusion**

This computed tomography scan based anthropomorphic study has identified novel anatomical features and associations of human forearm bones. This information will be used in the design and manufacture of anatomic intramedullary devices to better manage radius and ulna fractures or pathology.



**Category:** Knees

**ID:** 11165

## **MegaOAT of the Knee using Posterior Femoral Condyle Autograft. A Low Cost Option for Large Cartilage Defects in a Resource Restraint Environment.**

**Paper/Poster:** Paper

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**Co-Author 4 Institute :** Department of Orthopaedic Surgery, University of Cape Town, Groote Schuur Hospital

**Type:** no

### **Submission:**

#### **Introduction**

A 26-year-old patient presented to a specialized knee clinic in a public hospital with ongoing pain after having sustained a soccer injury six years prior. A large osteochondral defect of the distal medial femoral condyle was diagnosed. Due to resource limitations, allograft or a Mega Osteochondral Autograft Transplantation (MegaOAT) workbench was unavailable.

#### **Methods**

The postero-medial femoral condyle was harvested in line with the posterior cortex of the femur. The osteochondral lesion of 2 x 3 cm was overdrilled with a store bought 25mm flat drill bit. The harvested condyle was shaped with a rongeur to fit into the lesion using a press fit technique.

#### **Results**

An MRI at 6 weeks showed early incorporation of the graft. At one year follow up the patient reported no knee pain, had no sagittal or coronal instability, had a range of motion of 00 – 1300, and had perfect EQ5D, KOOS and Lysholm scores.

#### **Conclusion**

MegaOAT of the knee is possible without a specialized workbench or tools and had good clinical outcomes at a one year follow up of the patient.



**Category:** New Research in Orthopaedics (Research concept; Proposal; idea)

**ID:** 11166

## **Orthopaedic Implant Design from Concept to Final Product. A Design Surgeon's Experience.**

**Paper/Poster:** Paper

**Author :** Henry Sean Pretorius

**Author Institute :** Stellenbosch University

**Co-Author 1:** Nando Ferreira

**Co-Author 1 Institute :** Stellenbosch University

**Type:** no

### **Submission:**

#### **Introduction**

Orthopaedic surgeons are invariably faced with situations where contemporary surgical techniques and implants are not satisfactory for a specific clinical scenario. One such scenario frequently arises around the lack of implant choice for intramedullary fixation of radius and ulna fractures.

#### **Methods**

Design process

Phase 1: Identifying a need

Current intramedullary forearm devices have abandoned the ability to place interlocking screws at the non-driving end and are therefore not length stable. As current nails only come in 20mm length increments, this may pose challenges attaining accurate anatomical length restoration.

Phase 2: Concept

1. Anatomically designed in terms of length, diameter and radius of curvature.
2. Nail inventory that has optimal choice of implants to manage the majority of forearm injuries.
3. Locking system at the non-driving end that is easily targeted and has an acceptable radiation exposure for free hand locking.

#### **Results**

Phase 3: Anatomical study

Multi-planar reconstruction (MPR) of upper limb CT angiography scans were used to analyse the forearm osteology of 98 individuals. Primary measurements included the lengths of both radius and ulna shafts, the minimum canal diameter size, the proximal shaft angle of the ulna and the radius of curvature of the radius. The size of the proximal ulna and distal radius were also measured for design parameters of the non-driving end of the nail.

Phase 4A: Prototype design

To improve the usability of these nails, the design priorities were set as:

1. Locking hole design
2. Jig and instrument design for insertion and removal
3. Pressure release during insertion

PHASE 4B: Prototype testing:

Prototype testing consisted of nail insertion into human cadaver forearm bones using the initial prototype and instruments. The design aspects of the implant such as the locking holes with x-ray assisted screw insertion or the radius of curvature also needed to be evaluated.



**Conclusion**

The design process progresses through various distinct phases that are both time consuming and expensive. The bureaucracy and legal implications can be daunting to the first-time designer and it is important to engage with relevant professionals to limit unnecessary time and financial wastage.



**Category:** Trauma

**ID:** 11167

## **Evaluating the Design Modifications of an Intramedullary Forearm Nail System: A Cadaver Study.**

**Paper/Poster:** Paper

**Author :** Henry Sean Pretorius

**Author Institute :** Stellenbosch University

**Co-Author 1:** Nando Ferreira

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**Co-Author 2:** Marilize Burger

**Co-Author 2 Institute :** Stellenbosch University

**Type:** no

### **Submission:**

#### **Introduction**

We designed a modified forearm nailing system based on an anatomical study. All nail dimensions were based on this study including length, diameter, driving end width as well as radius of curvature. Unique design features include longitudinal surface flutes that allow pressure release during nail insertion and newly designed locking holes that offer a larger approach and escape angle for ease of interlocking screw insertion.

#### **Methods**

A cross sectional cadaveric study to evaluate the design modifications of the forearm nail. Ten cadavers were used and the only prerequisite was normal forearm anatomy. Radius nails were pre-bent to a radius of curvature of 569 mm and the ulna nails were pre-bent to 100 as per the anatomical study. All nails were assessed for insertions of interlocking screws through the jig at the driving end . All nails were locked using a fluoroscopic image intensifier and the free hand technique through both non-driving end locking holes. Locking times and exposures were recorded.

#### **Results**

The entry point was identified and the 6mm drill was successfully inserted in all cases (n=40, 100%) (Table 1). The shaft was reamed successfully in 90% of cases (n=36) and the nail was successfully inserted into these bones. All nails that were successfully inserted were available for locking (n=38). All locking attempts at both the driving end (n=38, 100%) as well as the non-driving end (n=76, 100%) were successful. Free hand locking at the non-driving end of the nail (36 cases, 72 locking holes) took a median of 44.5 seconds whilst the number of exposures ranged from 2 to 12 with a median of 5.5 exposures. The median total exposure time for the free hand locking procedure was 0.09 minutes. Nails were successfully removed in all cases.

#### **Conclusion**

The aim of this study was to evaluate the design modifications of this forearm nailing system.

The successful implanting of nails in all cases where the bones could be reamed shows an acceptable implant diameter for most individuals. It was observed in this study that the exposure for locking was a maximum of 0.23 min (13 sec).



**Category:** Trauma

**ID:** 11168

## **SI Screw vs Locking Square Plate Fixation in Sacroiliac Joint Disruption on Composite Bone Models**

**Paper/Poster:** Paper

**Author :** Erik Kloppers

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**Co-Author 1:** Johan Van der Merwe

**Co-Author 1 Institute :** University of the Free State

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

The aim of this study was to compare a locked square plate to a standard sacroiliac screw on a composite pelvis bone model to assess the ultimate load tolerated before failure of the fixation and to describe the mode of failure of the construct.

#### **Methods**

Bilateral sacroiliac (SI) joint dislocations were created in 10 composite pelvic bone models. In this descriptive comparative study the one SI joint was fixated using a 7.3mm cannulated screw and the contralateral side fixated using a 4-hole square locking plate. The pubic symphysis was not fixated. A vertical load was manually applied to each respective SI joint using a hook around the sciatic notch. The ultimate load to failure and the mode of failure was recorded for both groups.

#### **Results**

The mean load to failure for the SI screw group was 310 N and for the SI plate group 580 N. The ultimate load to failure was significantly lower in the SI screw group ( $p=0.0002$ ). There was no hardware-related failures recorded in any of the fixations in the study. The SI screw group had failure through a fracture of the sacrum in all the specimens. In the SI plate group fractures of the sacrum and ilium constituted, respectively, 60% and 40%.

#### **Conclusion**

A locked square plate fixation is superior to a single SI screw at ultimate load to failure when a vertical load is applied to the sacroiliac joint in a composite bone model.



**Category:** Shoulder & Elbow

**ID:** 11169

## **Epidemiology of Shoulder Dislocation at Chris Hani Baragwanath Academic Hospital over a One-year Period**

**Paper/Poster:** Paper

**Author :** Prince-Stoffel Motlolisi

**Author Institute :** Department of Health Gauteng

**Co-Author 1:** Nyiko Chauke

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**Co-Author 2 Institute :** Chris Hani Baragwanth academic hospital

**Type:** no

### **Submission:**

#### **Introduction**

Anterior shoulder dislocation is the commonest clinical presentation of gleno-humeral joint instability. Shoulder dislocation incidence of 56.3 per 100 000 person-years have been reported. This is associated with morbidity and heavy burden on the country's healthcare system. This study aims to investigate the epidemiology of shoulder dislocations at Chris Hani Baragwanath Academic Hospital (CHBAH).

#### **Methods**

Our study was a retrospective analysis of records of patients who presented at the Orthopaedic trauma unit at CHBAH with shoulder dislocations during the period of 01 June 2016 to 31 May 2017. Our study's main outcome measures were shoulder dislocations and associated injuries. Ethics approval was granted by the Human Research Ethics Committee (HREC) (Medical), University of the Witwatersrand prior to data collection. Moreover, permission to conduct the study was obtained from the Chief Executive Officer (CEO) at CHBAH prior to data collection.

#### **Results**

The incidence of shoulder dislocations was found to be 34.9%. Most of our patients were males with a mean age of 43.5 years. Patients in the age-group 21 to 40 years accounted for the majority of all the dislocations (45.4%). We observed that approximately two-thirds of the shoulder dislocations occurred in the colder months (Autumn & Winter seasons) and less than one-tenth of the patients required admissions. Anterior dislocations accounted for the majority of the cases (99.4%). Most of the dislocations were on the right shoulder (56.9%) and about a tenth of these patients with shoulder dislocations also had associated fractures; the humerus being the most affected bone.

#### **Conclusion**

Our study found that, although the majority of dislocations were found in young active males, in patients older than 60 years, females had a higher dislocation rate in comparison to their male counterparts. Efforts to improve safety in these elderly patients (> 60 years) require prioritisation to reduce shoulder injuries in this high-risk group.



**Category:** Knees

**ID:** 11171

## **Corticosteroid vs Platelet-Rich Plasma (PRP) Injections for Knee Osteoarthritis following COVID-19 Pandemic – A Review of Recent Evidence**

**Paper/Poster:** Paper

**Author :** Young Seok Cho

**Author Institute :** East Kent Hospitals University NHS Foundation Trust

**Co-Author 1:** Shruti Raut

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**Co-Author 2 Institute :** Maidstone & Tunbridge Wells NHS Trust

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Intra-articular corticosteroid injection has been a viable treatment option for patients with osteoarthritis (OA) of the knee. Inevitably, concerns were raised during the COVID-19 pandemic regarding the potential adverse systemic effect. This has led to an increase in promoting treatment options such as intra-articular PRP injections, which has historically shared divided opinions regarding its efficacy in OA. The objective of this study was to review the recent literature on the efficacy of corticosteroid versus PRP injection for patients with OA of the knee.

#### **Methods**

Medline and Embase searches were performed to reveal all studies including variation of terms; steroid, PRP, and knee osteoarthritis in the title or abstract. These references were then reviewed to only include studies directly comparing steroid and PRP injections for knee OA, with their full text published between 2018-2020. 10 relevant studies, including 3 meta-analysis were scrutinised in attempt to gain a consensus on which injection is preferable, particularly considering the current pandemic.

#### **Results**

Of the three meta-analysis, one concluded that corticosteroid injection provided best pain relief with the lowest rate of adverse effects in comparison to all other injection therapies. Another mentioned that there was a clinically significant difference favouring PRP against steroids in terms of pain and functional level, although this was only based on 2 studies. The remaining meta-analysis was unable to conclude the superiority of one over the other, stating uncertainly in efficacy for PRP injections. Further 5 clinical trials concluded that PRP was more effective than steroid injections, whilst 1 study suggested steroid had an additional effect of improving stiffness in knee. Remaining study showed equivocal results between the two.

#### **Conclusion**

Overall, there was no obvious consensus on which intra-articular injection is superior in treating knee OA. At present stage, there is a lack of clear evidence in relation to intra-articular corticosteroid use with COVID-19. There is definitely a role for PRP injections, however the implication of its cost needs to be carefully considered, given the current economic climate following COVID-19.



**Category:** Arthroplasty

**ID:** 11172

## **Current Insights into Metal-on-Metal Bearing Hip Replacements and Detrimental Effects on Adult Male Fertility**

**Paper/Poster:** Paper

**Author :** Young Seok Cho

**Author Institute :** East Kent Hospitals University NHS Foundation Trust

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**Co-Author 2 Institute :** Gloucestershire Hospitals NHS Foundation Trust

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

A myriad of studies has shown an increase in blood concentration of cobalt and chromium after Metal-on-Metal (MoM) hip arthroplasty, with concerns over many systemic effects. However, a detrimental effect on male fertility is not an area that has been proven. We set out to identify and systematically review published reports on possible decreased male fertility, attributed to metal ions released systemically after undergoing MoM hip arthroplasty.

#### **Methods**

Medline, Embase and Pubmed searches were performed using all variations of the term 'metal-on-metal'. This was then combined with search terms concentrating on male fertility. A combination of both searches revealed 39 studies, which were analysed and restricted to arthroplasty and human studies. The resulting two studies and two further abstracts were analysed, in attempt to gain a consensus on whether MoM arthroplasty does indeed affect male fertility.

#### **Results**

Four articles assessed 81 individuals who has either had a MoM hip replacement, or a Metal-on-Polyethylene (MoP) hip replacement within comparative studies. One article concluded that increased levels of cobalt and chromium were seen in blood and seminal fluids of patients who had MoM hip replacements. This effect also translated to a decreased morphology of sperm in the affected group. However, this conclusion was not unanimous. The other studies resulted in conclusions stating that although there was an increase in blood levels of cobalt and chromium in patients following a MoM hip replacement, there was no overall effect on seminal fluid analysis, with normal sperm morphology.

#### **Conclusion**

This systematic review has analysed all available literature, which addresses the potential issue of sub-fertility in male patients as a result of MoM hip replacements. Although the sample sizes are small, it is clear that no consensus exists at present stage, and further research in this field is required.



**Category:** Current Topics (COVID-19)

**ID:** 11173

## **Trampoline Injuries are Bouncing Back: The Effect of the COVID-19 UK Lockdown on the Paediatric Trauma Burden**

**Paper/Poster:** Paper

**Author & Presenter:** Yahya Ibrahim

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Background: This observational study examines the effect of the COVID-19 pandemic upon the paediatric trauma burden of a district general hospital trauma centre. Our aim has been to compare the nature and volume of the paediatric trauma of the 2020 UK lockdown period with the same period in 2019. Our null hypothesis being that there was no statistically significant difference between the two samples.

#### **Methods**

Methods: Prospective data was collected from 23/03-14/06/2020 and compared with retrospective data collected from 23/03-14/06/2019. Patient demographics, mechanism of injury, nature of the injury and details of any surgery were tabulated and statistically analysed using the independent t-test for normally distributed data and the Mann-Whitney-U test for non-parametric data. Additionally, patients were contacted by telephone to explore further detail about the mechanism of injury where required and gain some qualitative insight into the risk factors for injury.

#### **Results**

Results: The 2020 lockdown resulted in 30% fewer paediatric attendances to the fracture clinic, but no significant change in the number of patients requiring surgery. Trampolining injuries increased most dramatically (168% increase observed,  $p < 0.001$ ), and high energy trauma from road traffic accidents and falls from height decreased significantly (21.5% decrease,  $p < 0.001$ ). The trampolining injuries disproportionately affected younger patients; with a higher requirement for surgery, despite a more conservative approach to treatment during the lockdown period. The most common risk factor for trampolining injury included concurrent usage with an older child.



**Conclusion**

Conclusion: COVID-19 lockdown has resulted in a decrease in paediatric orthopaedic presentations and high energy trauma. However, due to a compensatory and stark increase in home trampolining injuries, there has been no change in the proportion of patients requiring surgery. As home exercise becomes more prevalent, a duty of public health falls upon clinicians to advise parents regarding the dangers of trampoline usage, in the same way they would with any other dangerous sport or risky activity.



**Category:** Foot & Ankle

**ID:** 11174

## **The Central-Splitting Approach and Augmentation of the Procedure using Flexor Hallucis Longus Tendon Transfer in Patients with Haglund Deformity and Achilles Insertional Tendinopathy.**

**Paper/Poster:** Paper

**Author :** Ricarda Luise Gaudin

**Author Institute :** Groote Schuur Hospital, University of Cape Town

**Co-Authors:** S Wever, R Dey, G McCollum

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Haglund syndrome is a common cause of posterior heel pain, characterized clinically by a painful soft tissue swelling at the level of the achilles tendon insertion. The central-splitting approach and augmentation of the Achilles tendon using Flexor Hallucis Longus (FHL) tendon transfer has been described as a surgical option for failed conservative treatment. In our study the Central splitting Approach and augmentation of the procedure using FHL transfer in patients with Haglund Deformity and Achilles Insertional Tendinopathy was investigated.

#### **Methods**

26 patients (20 female and 6 male) that underwent surgical treatment during January 2013 to January 2019 with central-splitting approach and FHL transfer with a minimum follow-up period of 12 months were reviewed at one surgeons practice. Outcome measures included the Patient Reported Outcome Measurement Information System (PROMIS) score, Visual Analogue Scale (VAS) and a single leg heel raise.

#### **Results**

Both PROMIS scores and VAS showed statistically significant Improvement with overall patient satisfaction. All patients were able to return to previous function with no major complications. Over 80% of the patients were able to perform a single leg heel raise and there was no perceived weakness of hallux flexion.

#### **Conclusion**

The central-splitting approach, debridement, re-attachment and augmentation of the achilles tendon using FHL transfer is an effective method with marked improvement in function for patients with Haglund Deformity and Achilles Insertional Tendinopathy.



**Category:** Spine

**ID:** 11175

## **Unexpected Post-operative Deaths in Elective Spine Surgery - Lessons Learnt**

**Paper/Poster:** Paper

**Author :** Robert Dunn

**Author Institute :** UCT

**Type:** no

### **Submission:**

#### **Introduction**

Despite modern anaesthesia and ICU and HCU monitoring, post-operative deaths persist. They may be expected in poor hosts or emergency surgery, but occasionally they occur following elective surgery taking the care team by surprise.

The review identified such unexpected deaths for review.

#### **Methods**

A prospectively maintained patient database was interrogated for post-operative deaths within the post-operative hospital admission. These patients case notes were reviewed as to the sequence of events and cause of death, and whether they could have been better managed with the benefit of hindsight.

#### **Results**

During the period 2001 - 2020, 4221 single surgeon spine surgeries were logged in the database. Eighteen (18) patients with unexpected post-operative death were identified representing an incidence of 0.4%. Three (3) were children, two (2) died in theatre and the rest manifested problems in the ward.

The causes ranges from uncontrollable bleeding due to portal hypertension from cirrhosis and hyperuraemia; unresponsive sepsis; exaggerated SIRS in neuromuscular conditions and "silent" duodenal perforation and pulmonary embolus from pre-op recumbency and missed DVT.

#### **Conclusion**

Post-operative mortality remains a real risk in elective spine surgery at around 0.4%. Pre-operative and post-operative awareness of the myriad of medical risks remain a challenge to the surgeon and treating team.



**Category:** Spine

**ID:** 11176

## **TB Spine and Contiguous Aortic Aneurysm**

**Paper/Poster:** Paper

**Author:** R Magampa

**Co-author 1:** L Noconjo

**Co-author 2:** R Dunn

**Type:** no

### **Submission:**

#### **Introduction**

TB spine is relatively common in South African. Typically there is a paraspinal abscess. This is close to the aorta. Very rarely the contiguous abscess can cause aortic wall pathology.

We present a case of TB spine related aortic aneurysm with intra-operative rupture and successful management.

#### **Methods**

A case note and literature review was performed.

#### **Results**

A internationally competitive CrossFit athlete is presented with vague back pain finally confirmed to be TB spine after initial misdiagnosis. She failed to respond and was confirmed to be a rapid Rifampicin metabolizer. Intra-operatively there was a massive high pressure bleed from the aorta when the abscess was removed. This was successfully tamponaded with a Foleys urinary catheter balloon and definitively repaired endovascularly. In retrospect there is a suspicion of aortic wall damage on the preop MRI.

#### **Conclusion**

Although rare, contiguous TB spinal abscess can cause an aortic aneurysm. It may be visible on pre-op axial MRI and should be considered. If it occurs Foley's balloon tamponade is useful for immediate control.



**Category:** Trauma

**ID:** 11177

## **Gun Related Injuries in Trauma: The GRIT Study**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

South Africa has the 11th highest gun related mortality in the world. However, around these deaths are many more patients who are injured. Gunshot related injury has been recognised as a highly costly healthcare problem by individual treating centres, however no 'national picture' has been examined in detail. Given the vast resource implications, this study sought to explore the burden of gunshot related orthopaedic injuries across South Africa.

#### **Methods**

A network was established across South Africa and 37 orthopaedic units representing 9 provinces joined. A snap shot cohort study was conducted which ran over two weeks. Data was captured by the local orthopaedic teams. Patients were eligible if they had at least one acute gunshot related orthopaedic injury referred to the orthopaedic service. Patients who enrolled in the study were asked additional research questions around health-related quality of life and personal circumstances. Follow up was at 6-8 weeks after injury.



### **Results**

Thirty-seven centres enrolled 135 patients over the study period. The Western Cape had the highest number of cases (52), followed by Gauteng (35) and KwaZulu-Natal (29). The median age of patients was 32.5 years and the overwhelming majority were male (89%). Forty three percent of patients had been either shot or stabbed before.

The femur was the most commonly affected bone (n=29). All but two of the femoral fractures were treated with surgery, whereas 12 of the 24 tibial fractures were treated without surgery. Most patients were discharged back to their community however 37% of patients didn't return for routine clinical follow up and no outcome could be recorded.

### **Conclusion**

Gunshot related orthopaedic injuries amounts a major burden on healthcare resources across the country. The true burden is most likely grossly underestimated.

There is significant variation in management of the gunshot related fractures. In comparison to other countries such as the United States, there is a greater tendency to non-operative treatment. However, challenges with follow up preclude determining effectiveness of these alternative treatment options. Furthermore, the variation in treatment and uncertainty around outcome make more detailed clinical effectiveness research a major priority.



**Category:** Shoulder & Elbow

**ID:** 11179

## **Identifying Risk Factors Contributing to the Development of Shoulder Pain and Injury in Male, Adolescent Water Polo Players.**

**Paper/Poster:** Paper

**Author :** Yale Jameson

**Type:** no

### **Submission:**

#### **Introduction**

A high incidence of shoulder injuries is observed in male water polo players. However, there are limited studies identifying risk factors to shoulder injuries in the adult population and none in the adolescent population. The aim of this study was to determine the relationship between shoulder injury prevalence and potential risk factors during a male adolescent water polo season.

#### **Methods**

Forty-nine adolescent water polo players aged 14 to 18 years old were recruited for the study. Pre-season testing required participants to complete a demographic information sheet, a Kerlan-Jobe Orthopaedic Clinic Shoulder and Elbow Score questionnaire (KJOC) and a battery of tests which included: anthropometry, pain-provocation tests, glenohumeral and upward scapula range of motion, glenohumeral and scapula muscle strength, glenohumeral flexibility and shoulder stability measurements. At the end of the season participants completed an injury report and training load questionnaire. Participants that indicated they experienced shoulder pain throughout the season were categorised into the injured group and those who did not were categorised into the uninjured group.

#### **Results**

The average age of this population was 15.7 ( $\pm$  1.3) years old; 83.7% of these participants reached their peak height velocity before the pre-season screening. Twenty-four participants (49%) experienced shoulder pain during the season. The dominant shoulder was more commonly affected (54.2%), whilst throwing (41.7%) and shooting (20.8%) was identified as the most common aggravating factor. Twenty-six participants (53.1%) had positive symptoms on one or more of the shoulder pain provocation tests. The injured group exhibited significantly lower scores on the pre-season KJOC questionnaire ( $p = 0.01$ ) and had more positives on the pre-season pain provocation tests ( $p = 0.02$ ) compared to the uninjured group. However, there were no factors significantly correlated with an increased risk of injury.

#### **Conclusion**

The prevalence of shoulder pain in male adolescent water polo players is high. The pre-season screening identified poor pre-season shoulder functionality and positive results on the pain provocation tests were associated with sustaining shoulder pain during a male adolescent water polo season. Therefore, the inclusion of these assessments during pre-season may be vital for identifying players at risk for sustaining shoulder pain during the season.



**Category:** Knees

**ID:** 11180

## **Impact of Correctable Mediolateral Femorotibial Subluxation on Implant Survival in Patients with Anteromedial Osteoarthritis**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Medial unicompartmental knee arthroplasty (UKA) is advocated for treating symptomatic anteromedial osteoarthritis (AMOA). Correctable mediolateral tibiofemoral subluxation can be safely ignored according to the UKA enthusiasts. However, no clinical studies compare the results in AMOA patients with and without subluxation.

This study reports the early prospective clinical outcomes of medial UKA in AMOA, with and without correctable mediolateral femorotibial subluxation and the comparison to the retrospective larger patient cohort.

#### **Methods**

An initial retrospective study (R) consisting of 436 consecutive UKA cases' (388 patients evaluated from May 2012 to October 2017) results were compared with a prospective study (P) consisting of 272 cases in 248 patients with AMOA evaluated from November 2017 to May 2020. All patients in both cohorts underwent cementless Oxford UKA and were classified into two groups: Group 1 (AMOA without mediolateral subluxation) and Group 2 (AMOA with mediolateral subluxation) on anteroposterior (AP) knee stress views. Survival analysis methods (Kaplan-Meier and log rank test) were utilized to compare implant survival between the two groups (1 and 2) and the cohorts (R and P). The multivariable Cox proportional hazards model was used to determine risk factors for time to revision.

#### **Results**

The two cohorts, R and P had patient groups (Group 1 vs Group 2) matched for age, gender, wear pattern, pre-operative Oxford Knee Score and follow-up period. The overall implant survival for the P cohort that had at least 20 months of follow-up was 97.8%. The overall implant survival for Group 1 (98.7%) was significantly better compared with Group 2 (93.2%). These results are amplified in the R cohort with an average follow up of 54 months and with the Group 1 survival at 98.6% and Group 2 at 92.9%. Follow-up shows more failures in Group 2 compared with Group 1. Patient-reported outcome measures (PROMs) and range of movement were similar for both groups.



**Conclusion**

Patients with AMOA and correctable mediolateral tibiofemoral subluxation have a significantly higher risk of implant failure compared with those without subluxation. This study establishes this association which has an important implication on patient selection, but does not confirm causality.



**Category:** General

**ID:** 11181

## **Barriers to Publication amongst South Africa Orthopaedic Surgeons**

**Paper/Poster:** Paper

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

With a growing global burden of disease, there is an increasing requirement to improve the quality of healthcare. Subsequently, a rising demand for population-specific research exists. Research derived from developing countries is deficient, with the overwhelming majority of published research being conducted in developed countries. Recent literature from the South African Orthopaedic Association (SAOA) has shown that only 15.7% of research presented at its annual general meeting over a 6-year period was subsequently published in a peer-reviewed journal. The aim of this study was therefore to evaluate the barriers to publication amongst South African Orthopaedic surgeons

#### **Methods**

An anonymous online questionnaire was sent to all members of the SAOA. A 4-point Likert Scale was used to determine the degree to which 18 different factors were perceived to be a barrier to research and subsequent publication. A bi-variate analysis was conducted to determine the influence of age, sector of work, completion of MMed degree and fellowship on the perception of different barriers.

#### **Results**

There was total of 235 participants (response rate of 31.33%) of which 89.7% were male. There were 148 participants (63%) aged 30-45 years and 16 (6.8%) older than 61 years of age. There were 83 participants (35.3%) who worked in private practice only, while 68 participants (28.9%) worked in public hospitals only. There were 42% of respondents who had completed an MMed degree, while 37% had completed an international fellowship. Overall, the most common perceived barriers were lack of time for manuscript preparation, lack of time to collect data and lack of financial and logistical resources. Lack of interest in research was the least common barrier. Lack of time for data collection was a statistically significant barrier in respondents with international fellowship experience ( $p=0.045$ ). Resource constraints preventing data analysis are a significant barrier for 73.9% of surgeons aged 45-60 years ( $p=0.030$ ) but not in other age groups. Surgeons with a MMed degree, irrespective of age, fellowship experience and type of practice reported no significant barriers to future publications.

#### **Conclusion**

This study explores the potential barriers that limit South African Orthopaedic surgeons from more successfully completing research publications.



**Category:** Shoulder & Elbow

**ID:** 11182

## **Assessment of a Local Fellowship at a Tertiary Hospital in Cape Town, South Africa**

**Paper/Poster:** Paper

**Author :** Viseslav Boskovic

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**Co-Author 1:** Stephen Roche Roche

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

There is a growing trend towards sub specialization and fellowship training in orthopaedic surgery. Data from the United States has shown that over 90% of orthopaedic residents plan to pursue fellowship training and there is a trend in the orthopaedic job market toward seeking fellowship-trained orthopaedic surgeons. This study aimed to elucidate graduate perceptions of how the Upper Limb Surgery fellowship offered by the University of Cape Town (UCT) impacted their professional development and to identify potential means of improving the quality of the programme.

#### **Methods**

A descriptive, cross-sectional survey analysis was performed using an online questionnaire posing questions related to various aspects of the training programme. Subjects consisted of nine qualified orthopaedic surgeons who had completed the UCT Upper Limb Surgery fellowship. Survey questions were predetermined through discussion and agreement among the researchers.

#### **Results**

All emails sent drew responses to the survey. An overall good to excellent level of satisfaction with the various aspects of the training program was reported by the fellowship candidates. Post fellowship increase in arthroscopic and open surgical skill level, as well as understanding of research, was found to be significant. The majority agreed that the fellowship had adequately prepared them for work in their current setting. The candidates strongly agreed that the fellowship enhanced their abilities, when compared to their peers, in pre-operative decision making, intra-operative decision making, formulating ethical judgements, operative surgical skills and teaching ability. It was further observed that the reputation of the institute, faculty and clinical division offering the fellowship were the most important motivating factors in electing this particular fellowship.

#### **Conclusion**

The results confirm the positive impact of the fellowship on post-training levels of confidence across clinical, research, decision-making and educational domains. The study highlights the benefits of post-graduate fellowship training with the analysis being broadly applicable to similar training programmes globally. It underscores the importance of continuous evaluation of fellowship programmes and hopes to stimulate future studies directed at gaining a deeper understanding of the psychosocial impact of fellowship training.



**Category:** Trauma

**ID:** 11183

## **Epidemiology and Surgical Management of Distal Humerus Gunshot Fractures**

**Paper/Poster:** Paper

**Author :** Alasdair Bott

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**Type:** no

### **Submission:**

#### **Introduction**

Distal humerus civilian gunshot fractures pose a surgical challenge due to complex fracture patterns and the proximity to neurovascular structures around the elbow. The purpose of this retrospective study was to report the epidemiology of civilian gunshot injuries to the distal humerus and evaluate surgical reconstruction techniques.

#### **Methods**

We conducted a retrospective review of all adult (> 18 years) distal humerus gunshot fractures treated surgically at our level-1 Trauma Centre between January 2014 and January 2020 using electronic imaging records and case notes. Fracture patterns were classified according to the AO classification. Length of follow-up was defined as time between initial fracture stabilization and final documented contact with orthopaedic service.

#### **Results**

Twenty-six patients were treated surgically for low velocity civilian gunshots (Mean age 29 years, M:F 24:2). Eleven (42%) had associated injuries of other body regions. Eight patients (31%) suffered a brachial artery injury diagnosed on CT angiography all of whom had successful repair by vascular surgeons. Eleven (42%) cases of peripheral nerve injury were recorded (4 ulna nerves, 5 radial nerves and 2 median nerves), no acute nerve repairs were performed.

According to the AO classification 19 patients had extra articular fractures (AO13A3 fractures) seven had complete articular patterns (AO13C3). There were no partial articular (B type) fractures.

All fractures were definitively stabilised using conventional fixation techniques with a mean time to surgery of four days: Single bridge plating technique (12 cases), dual bridge plating technique (6 cases), Elbow spanning external fixator (6 cases), Staged fixation: elbow spanning external fixator converted to single bridge plating (2 cases). Fifteen (58%) of patients were lost to follow-up after 12 weeks, but of the remaining 11, 3 required



reoperation 1 for infection, 1 metalwork removal and one for non-union.

**Conclusion**

Gunshot distal humerus fractures have a high incidence of neurovascular injuries. These fractures were amenable to conventional surgical fixation techniques. Fractures with associated arterial injury can be successfully treated with revascularization and temporary external fixation and staged definitive fixation. As shown in other similar studies, this patient cohort poorly comply with follow-up treatment.



**Category:** Infection

**ID:** 11184

## **Demographics and Microbiology of Chronic Osteomyelitis in a Level One Trauma Centre in South Africa**

**Paper/Poster:** Paper

**Author :** Caterina Nicolaou

**Author Institute :** Gauteng Department of Health

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Chronic osteomyelitis is a complex disease. Chronic osteomyelitis secondary to traumatic long bone fractures is a burden on our healthcare system and a cause of long term morbidity. This disease may be classified based on the mechanism of infection and the duration of illness. It has been best classified by Cierny and Mader; who classified osteomyelitis according to the physiology of the host as well as the anatomic and radiological features.

We focus on Chris Hani Baragwanath Academic Hospital (CHBAH) the largest hospital within the country and third in the world. This level one Trauma centre observes a high volume of open fractures which puts patients at higher risk of developing Osteomyelitis; and serves a population who suffers the burden of Human Immunodeficiency Virus (HIV) and other comorbidities, putting them at higher risk of osteomyelitis. Orthopaedic surgery often involves implantation of foreign bodies during fracture fixation which adds to the promotion of infection in these already at risk patients.

#### **Methods**

Analysis of the demographics (age, gender, co-morbidities, cigarette and/or other recreational alcohol or drug use and Cierny and Mader classification) and prevalent bacterial species sampled directly from bone reamings is assessed via a retrospective data analysis. The study population consists of patients, over the age of 18, who initially underwent intramedullary femur or tibia nail removal and debridement, reaming and irrigation; before further osteomyelitis treatment was initiated. Patients include a sample population of 50 patients seen and treated at CHBAH between January 2017 and December 2018.

#### **Results**

Results indicate that Chronic Osteomyelitis is most prevalent amongst young male smokers. The bacterial species cultured range from Staphylococcus Aureus, both sensitive and resistant strains *Enterobacter*, *Enterococcus faecalis*, *Escherichia Coli*, *Klebsiella*, *Pseudomonas Aeruginosa*, *Proteus Mirabilis* and *Acinetobacter Baumannii*

#### **Conclusion**

The importance of these findings is that various bacterial species are involved with Chronic Osteomyelitis in this setting. Thus a broad spectrum antibiotic may not be the answer to treatment of this difficult disease. Hence there is a desperate need for a successful, microbe specific or antibiotic targeted treatment plan for such patients in our setting.



**Category:** Arthroplasty

**ID:** 11185

## **Condom Sterility in Priprosthetic Joint Infection Management at Universitas Academic Hospital**

**Paper/Poster:** Paper

**Author :** Ntsikelelo Tyumre

**Author Institute :** Universitas hospital

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Periprosthetic joint infections following joint arthroplasty are difficult to manage, which involves two-stage revision arthroplasty. A cement spacer impregnated with antibiotics is implanted in the joint and forms tight cement-bone complexes leading to massive bone loss on removal of the spacer. At our setting, we started using condoms to prevent the formation of these cement-bone complexes and therefore prevent massive bone loss. The aim of this study was to determine whether it was safe to insert condoms straight from the packaging into the hip or knee joint or whether sterilization was required before introducing condoms into the joint.

#### **Methods**

Microscopy, culturing and sensitivity (MC&S) were performed on 60 government issued condoms. Thirty condoms were sterilized by means of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) gas plasma prior to testing. The remaining 30 were not sterilized.

#### **Results**

Hydrogen peroxide gas plasma sterilized condoms were found to be completely bacteria-free. However, bacterial contamination was noted on 60% of the non-sterilized condoms. The organisms isolated were non-virulent common environmental or implant colonisers.

#### **Conclusion**

From these results we concluded that it is important to first sterilise condoms using heat-sensitive sterilisation method prior to introducing them into the joint. The sterilization process can be done at any hospital central sterilization services, making it readily available and cost effective. With regard to arthroplasty, using sterile condoms during the procedure will save the need and cost of acquiring revision implants, expensive joint spacers and mega-prostheses. It is recommended that further prospective studies be conducted to determine the durability of these condoms.



**Category:** Shoulder & Elbow

**ID:** 11187

## **Overhead Throwing Biomechanics Following a Run-Up in Cricketers: Implications for Injury Risk**

**Paper/Poster:** Paper

**Presenter:** Janine Gray

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**Type:** no

### **Submission:**

#### **Introduction**

Overhead throwing is the most vigorous activity associated with shoulder injury in sportsmen. To date, this motion has only been described using two-dimensional analysis when cricketers field with different approaches. Currently, the three-dimensional kinematic and kinetic characteristics of an overhead throw performed by cricketers following a run-up is unknown. Further, the potential shoulder injury risk associated with throwing from a stationary position and following a run-up, have yet to be explored.

#### **Methods**

Fifteen South African cricketers were recruited for participation in this cross-sectional cohort study. Each cricketer performed six overhead throws, from a stationary position and with a run-up over 15-20m prior to fielding a ball, respectively. Kinematic data and ground reaction forces were collected throughout the throwing trials. Joint kinetics were calculated using inverse dynamics. An independent t-test or Mann-Whitney U test was used to determine joint kinetic differences between throwing approaches. Differences between the kinematic waveforms for stationary and run-up throwing approaches were assessed using one-dimensional statistical parametric mapping ANOVA ( $p < 0.05$ ).

#### **Results**

The shoulder, elbow and thoraco-lumbar joints displayed similar kinematics between throwing approaches. The run-up approach displayed increased hip flexion between 0-34% and 57-100% ( $p=0.01$ ) of the throwing cycle; and lumbo-pelvic flexion between 57-65% ( $p=0.02$ ) of the throwing cycle; greater shoulder compression ( $p=0.02$ ) and posterior force ( $p=0.009$ ) at maximum external rotation; yet less superior shoulder force ( $p=0.005$ ) and elbow compression ( $p=0.03$ ), superior ( $p=0.002$ ) and medial ( $p=0.03$ ) elbow forces at the point of ball release, when compared to a stationary position.



**Conclusion**

Cricketers maintain similar upper limb kinematics between overhead throwing approaches. However, when throwing with a run-up, greater dominant hip and lumbo-pelvic flexion is noted. These kinematic variances contribute to cricketers experiencing approximately double the forces exerted on the shoulder during cocking, amplifying the potential risk for glenoid impingement and labral injuries. Conversely, half the shoulder compression is measured during ball release. Consequently, throwing approach when fielding in cricket may impact shoulder injury risk. The differences in shoulder load with various throwing approaches provides insight into the requirements for cricket specific conditioning programs and monitoring of throwing load.



**Category:** Trauma

**ID:** 11188

## **The Epidemiology and Orthopaedic Burden of Civilian Gunshot Injuries over a Four-year Period at a Level 1 Trauma Unit in Cape Town, South Africa**

**Paper/Poster:** Paper

**Author :** Shafique Jakoet

**Author Institute :** Western Cape Department of Health

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Purpose

The aim of this study was to quantify the overall burden of orthopaedic gunshot related injuries at our institution over a four-year period. Secondary aims included identifying complications from gunshot related injuries and the additional burden it places on healthcare services.

#### **Methods**

A retrospective review was conducted on all patients with gunshot injuries presenting to our hospital's trauma unit between January 2014 and December 2017. Patient data was recorded and demographic data, number and type of implants, blood products used, duration of hospital admission, duration of ICU admission, radiological studies performed and prevalence of complications was analysed.

#### **Results**

1449 patients with a mean age of 28.2 years  $\pm$  9.7 (range 2.0 – 71.0) were included in this study. The majority of these gunshot related orthopaedic injuries were sustained to the lower extremities and was treated non-operatively. The median duration of hospital stay was 7.0 (IQR 4.0 – 12.0). The most common complications identified were nerve injury (8.3%), vascular injury (6.5%), fracture-related infection (3.2%), non-union (3.1%) and compartment syndrome (1.6%). The total cost of care was ZAR 53 568 537 (4 320 043 USD) with an average cost per patient of ZAR 37 031 (2986 USD).

#### **Conclusion**

This study highlighted the burden of gunshot injuries presenting to our hospital and the strain it places on its healthcare resources. The prevalence of complications was comparable to international studies on the subject. With improved understanding of this burden more healthcare resources can be allocated to this problem and better prevention strategies planned.

#### **Keywords**

Gunshot injuries, complications, extremities, epidemiology



**Category:** Shoulder & Elbow

**ID:** 11190

## **Analysis of Scapular Fracture Patterns using Fracture Mapping**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Scapular fractures are mostly complex and difficult to understand using two-dimensional (2D) radiographs alone. This is due to the high energy nature of the injury mechanisms and the unique bone anatomy. However, with the use three-dimensional (3D) reconstructed computed tomographic images (CT) and medical image processing software, the understanding of actual fracture patterns has been improved. The aim of this study was to analyze scapular fracture patterns and identify the distribution and frequency of common fracture patterns.

#### **Methods**

A retrospective study was conducted on seventy scapular fracture patients at a government hospital Picture Archiving and Communication System (PACS) data base. The inclusion criteria were all scapular fractures with CT image data and complete scan of the fractured part. X-ray images, gunshot wounds, partial scans that could not show the fractured part and low-quality scans with artefacts were excluded. The 3D reconstruct of the CT images were created, the fracture fragments were reduced to their anatomical location, and fracture patterns were mapped to a healthy template scapula. The fracture types were categorized according to new validated AO/OTA classification method and the distribution and frequency of the fracture patterns were analyzed graphically and statistically.

#### **Results**

Extraarticular fractures (body + process) fractures were the most common type (61%) and articular segment fracture (14F0.B) was rare (4%). The lateral and medial borders were the common fracture exit zones, 69% and 67% respectively. The superior medial border and the medial extent of the base of the scapula spine were the higher intensity exit zones.



**Conclusion**

Scapular fractures reveal common patterns. The results in this study could be used to assist surgical planning and approach, to validate fracture classifications and more importantly to design optimal anatomical scapular implants



**Category:** Shoulder & Elbow

**ID:** 11191

## **Effect of Subscapularis Attachment Position on Tendon Length, Post-RTSA: An OpenSim Modelling Study.**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

The effectiveness of subscapularis (SSc) tendon repair in reverse total shoulder arthroplasty (RTSA) remains uncertain, studies have linked SSc repair to improved stability and decreased rates of dislocation in an RTSA shoulder. However, the SSc natural function as an abductor, forward flexor and internal rotator in the shoulder, could impede external rotation and overall range of motion (ROM) post-RTSA. The aim of this modelling study was to investigate the effect of attaching the SSc in different locations on the proximal humerus of a post-RTSA shoulder.

#### **Methods**

The RTSA shoulder joint was modelled in OpenSim using an adaptation of the Newcastle shoulder model. The SSc tendon length was measured for abduction, flexion and glenohumeral (GH) rotation at 20° and 90° abduction, both internal and external. Measurements were done on three SSc attachment points, native, superior, on the greater tubercle, and inferior, 20mm below native. The modelling was performed for both the Delta and Biomet RTSA implant configurations. The SSc tendon length in abduction, flexion and GH rotation was modelled in an anatomical and total shoulder arthroplasty (TSA) shoulder for comparison of SSc repair in different implants. Graphs were produced to show the change in tendon length as the joint moves through a ROM.

#### **Results**

For both RTSA implants the SSc length in the superior attachment position peaks towards the mid-point of the ROM, while native and inferior peak towards the extremes of the ROM. This indicates that, in the superior attachment position the SSc applies tension during motion, which will impede external rotation while the native and inferior positions will provide stability at the extreme ends of ROM. There were no major differences between RTSA implants. When compared to the TSA and the anatomic shoulder, the SSc tendon length is significantly shorter, indicating that the SSc tendon is contributing less to ROM in RTSA.

#### **Conclusion**

These results indicate that while the SSc plays less of a role in ROM for RTSA than TSA or an anatomical shoulder, its contribution is dependent on attachment points with a superior attachment contributing to ROM and a native or inferior attachment contributing to stability.



**Category:** Trauma

**ID:** 11195

## **Roentgenographic Review of Non Fluoroscopic-Assisted Surgically Treated Ankle Fractures.**

**Paper/Poster:** Paper

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

The decision to surgically fix ankle fractures is based on specific features that point to its intrinsic instability. The overall aim of surgical treatment is to restore the anatomic congruity of the ankle mortise. This is facilitated by intraoperative fluoroscopy use, which allows for easy assessment of fracture reduction. Significant patient burden and prolonged patient waiting time for surgery made the performance of some ankle fractures without fluoroscopic guidance pertinent. This study aims to review the adequacy of these surgeries.

#### **Methods**

A descriptive, retrospective cohort study of conveniently sampled adult patients with ankle fractures operated at a district level Hospital by Orthopaedic Registrars and Medical Officers without the aid of fluoroscopy between January 2017 and December 2017 with available, adequate pre and post-operative X-ray images on the IMPAXc system were reviewed.

Two Orthopaedic Surgeons independently evaluated post-operative plain radiographs of a cohort of ninety-nine patients that met the inclusion criteria. Adequacy of reduction was based on talar tilt, talar shift, talocrural angle, syndesmosis status, and misplaced hardware. Data were entered into a secure Microsoft Excel software. Association between assessment of evaluator one and evaluator two was determined using Fisher exact test. Inter-rater reliability (between evaluator 1 and 2) was assessed using Cohen's Kappa coefficient ( $\kappa$ ) and 95% confidence interval (CI). The analyses were performed using STATA version 16 (StataCorp, College Station, TX).

#### **Results**

Mean age of cohort is 42.0years  $\pm$  13.1 (range 20years – 78years; female= 62, male=37). The majority of the patients operated were supination external rotation (SER) and its equivalent Danis-Weber type B fracture. Sixty-nine patients, approximately 70% of the operated cohort were adjudged by both evaluators to be satisfactory and acceptable. Talar shift was responsible for most of the unacceptable radiograph reviewed; this was followed by intra-articular screw placement and talar tilt. The majority of the unacceptable reductions were in patients with supination external rotation (SER), accounting for 50% by both evaluators.

#### **Conclusion**

This study has presented that ankle fractures can be operatively repaired in carefully selected unstable ankle fracture types without the aid of fluoroscopy.



**Category:** Shoulder & Elbow

**ID:** 11196

## **Pre-operative Planning in Reverse Total Shoulder Arthroplasty: Comparison of Native Glenoid Parameters Measured on Two-dimensional CT Scan, X-rays and Two Commercial Computer Templating Programs**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

The purpose of this study was to compare glenoid version, inclination, bone loss measurements and humeral head subluxation measurements performed by South African shoulder surgeons on plain radiographs, 2-dimensional CT-scan images and those measured by 3-dimensional scan based commercially available shoulder arthroplasty pre-operative templating systems.

#### **Methods**

Radiographic images and 2D CT images of 10 shoulders planned for reverse shoulder arthroplasty were evaluated and native measurements performed by 12 shoulder surgeons on Morton's Picture archiving and communication system (PACS). The same 10 CT-images were loaded on Materialise® TruMatch and Tornier's Blueprint® pre-operative templating systems and native measurements provided by the 2 systems were compiled and compared to those done by the surgeons. Interclass correlation coefficient (ICC) were calculated to measure the surgeons' inter-rater reliability. Kruskal-Wallis one-way analysis of variance was performed to compare the measurements from the software and the surgeons.

#### **Results**

The inter-rater reliability was poor (average ICC: 0.4) when the surgeons' responses were compared for the X-ray data. In the case of CT data, the surgeons' were more similar and moderate (average ICC: 0.7) inter-rater reliability was observed. For version, tilt, and humeral head subluxation, the measurements provided by the software were significantly different ( $p < 0.05$ ) from the surgeon's measurements. This significant difference was observed mostly for glenoid version, followed by glenoid tilt and the list of humeral head subluxation. The measurements provided by the TruMatch and the BluPrint varied by an average of 4.3mm, considering all the morphometric parameters observed, and this difference was not found to be significant ( $p > 0.05$ ).



**Conclusion**

In this study we showed that the morphometric measurements obtained from the commercial software are considerably different from the surgeons' measurements using 2D Ct scans. We advise surgeons to be aware of this when planning shoulder replacement surgery



**Category:** Trauma

**ID:** 11197

## **Fracture Related Infections in a Provincial Hospital Orthopaedic Department - A Retrospective Audit**

**Paper/Poster:** Paper

**Author :** Hendrik Schoeman

**Author Institute :** Western Cape Department of Health

**Type:** no

### **Submission:**

#### **Introduction**

Fracture related infections (FRI) in Orthopaedic surgery can be devastating leading to significant morbidity, mortality, extended hospital in-patient stays, and an economic burden to limited hospital resources. A perceived high FRI rate was identified in an Orthopaedic department that strives to deliver an excellent Orthopaedic surgical service to the community it serves and this necessitated the need for investigation into possible contributing factors that could be addressed.

#### **Methods**

A three pronged approach to data collection was utilised:

- 1.) A retrospective analysis of reported FRI complications over period of 6 months.
- 2.) A personal observational analysis was performed of 50 cases including trauma and elective surgery documenting the number of pre-determined violations/breaches in the chain of sterility.
- 3.) A survey was distributed to all staff working or involved in Orthopaedic theatres including doctors, nurses, cleaners and administrative staff to determine the culture of staff in theatre towards surgical practices to ensure sterility and a subjective gauge of their knowledge.

#### **Results**

An overall infection complication rate was identified as 1.4% for all surgeries which according to a literature review is an acceptable rate. The rates were as follows: A 1.6% FRI for trauma cases, 0.7% for other elective surgery (not including arthroplasty) and a 0% rate of Peri-prosthetic joint infections following elective arthroplasty.

A significant discrepancy was noted between trauma and arthroplasty not only in the infection rates but in the number of observed violations during surgery, an average of 4.1 versus 1.3 for trauma surgery and elective arthroplasty respectively.

#### **Conclusion**

A striking discrepancy was observed between the infection rates for trauma surgery versus elective arthroplasty and the observed culture in theatre as well as adherence to sterile techniques and practices. A need for ongoing education was identified and a change in the manner in which sterile techniques and practices are enforced and maintained.



**Category:** Current Topics (COVID-19)

**ID:** 11198

## **It Was Safe To Operate At Our Hospital During The COVID-19 Pandemic. 30-day Mortality and Hospital-acquired COVID-19 Infections at Groote Schuur Hospital.**

**Paper/Poster:** Paper

**Presenter:** Michael Held

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**Type:** no

### **Submission:**

#### **Introduction**

Initial local and global evidence has suggested that COVID-19 positive patients who undergo surgery have a significantly increased mortality risk post-surgery. Reports have also suggested that patients who contract COVID-19 peri-operatively have increased mortality rates. There are limited data on mortality and COVID-19 hospital-associated-acquisition in vulnerable patients who have undergone orthopaedic surgery at a government hospital in South Africa (SA) during the COVID-19 pandemic.

#### **Methods**

This prospective study included patients who underwent orthopaedic procedures from 1 April 2020 (beginning of COVID-19 case increase in SA) to 31 July 2020 (COVID-19 peak in SA). Orthopaedic patients were COVID-19-positive if they had laboratory confirmed positive nasopharyngeal or oral swab via quantitative PCR for SARS-CoV-2 RNA. 30-day mortality and the presence of hospital acquired SARS-CoV-2 infection was assessed telephonically for orthopaedic patients who underwent orthopaedic procedures.

#### **Results**

Overall, a total of 433 operations were carried out amongst 347 patients from 1 April to 31 July 2020. Of these patients 225 (65%) were males, 121 (35%) were females and 1 was unknown. The mean age of patients was 42.5 (SD 16.80, range 9 - 89). We report 0 COVID-19-related postoperative deaths and 1 (0.2%) post-operative COVID-19 positive case during the study period.



**Conclusion**

There were no COVID-19-related postoperative deaths and one (0.2%) post-operative COVID-19 positive case, from contactable patients, during the study period. This does not correlate with other reports of centers who have reported from similar time-frames during the epidemic. Regarding mortality and COVID-19 infection risk, we can conclude that with the appropriate measures taken, it was safe to be operated on at our hospital during the peak of the pandemic in SA.



**Category:** Shoulder & Elbow

**ID:** 11199

## **Reverse Total Shoulder Arthroplasty: A Surgeon Survey on Pre-operative Planning Procedures and Surgical Decision Making**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

The goals of arthroplasty pre-operative planning procedures are to predict component sizes and placement, reduce surgical procedure duration, anticipate difficulties and minimise risk of complications. We hypothesized that shoulder surgeons will follow same planning processes for reverse shoulder arthroplasty and accept similar glenoid component placement.

#### **Methods**

A total of 12 members of South African Shoulder & Elbow Society participated in this survey. The survey assessed surgeon's protocols for reverse shoulder arthroplasty pre-operative planning, ideal glenoid component placement, stable baseplate fixation and the reasoning for choosing this implantation. This survey also included questions regarding the surgeon's experience, the number of RTSA procedures they perform annually, and their sector of practice.

#### **Results**

Our survey shows that 42% of the shoulder surgeons work both in private and public sector hospitals. Most of them (42%) perform < 15 RTSA surgeries annually. Fifty percent of the surgeons taking part in our survey had > 10 years of experience.

Regarding pre-operative planning, most of the surgeons (83%) preferred CT reconstruction as opposed to X-rays. Software programs were reportedly used by 50% of the surgeons. Most of them (83%) did not use 3D printing to aid their pre-operative planning. All but one surgeon (92%) reportedly used the Deltpectoral (DP) as their preferred was of surgical procedure. Highly experienced surgeons (> 10 years) preferred a < 10-degree retroversion while most of the surgeons (50%) preferred a 0 degree of retroversion. While most of the surgeons (42%) reported to not tilt the glenosphere (0 degree), highly experienced surgeons preferred to tilt the implant in either the inferior or superior direction, by at least 5 degrees. Higher inconsistency was observed in terms of central peg depth with 33% of the surgeons preferring > 10mm insertion followed by 25% of the surgeons preferring a > 15mm insertion depth.

#### **Conclusion**

In our study we found that highly experienced surgeons and less experienced surgeons have distinctive methods of pre-operative planning. Pre-operative consensus among surgeons vary greatly in terms of glenoid version, tilt, and head subluxation. These variations might be a factor of the surgeons' experience.



**Category:** Arthroplasty

**ID:** 11200

## **Development of a Validated Radiographic Scoring Tool for Surgeons Performing Total Hip Replacements**

**Paper/Poster:** Paper

**Author :** Woyisile Nkomo

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**Type:** no

### **Submission:**

#### **Introduction**

Good preoperative planning based on x-rays can help with the accurate prediction of size and component placement specific to the individual patient's anatomy. There are numerous studies documenting patient outcomes following hip arthroplasty but a paucity of literature scoring the surgeon's ability to predict and then fulfil planned placement of joint replacement components.

According to the author's knowledge, no validated radiographic scoring tool for surgeons performing total hip replacements exists.

#### **Aim**

This study aims to produce a reliable, self-scoring, radiograph-based checklist for surgeons training to perform hip arthroplasty. Such a tool will improve awareness around the surgical procedure and document accuracy in hip joint arthroplasty.

#### **Methods**

Our study involves two phases;

The first phase tests the reliability of our hip scoring tool. We retrospectively applied the score to 20 templated hips and got 3 expert observers to individually in isolation score the x-rays to test reliability.

We commenced with the second part of the study once the tool was assessed to be reliable using the appropriate statistical methodology. In the second part of the study we applied the tool to measure the difference between junior and senior registrars. The second part of the study is a pilot for the purposes of a future prospective study.

The statistical analysis was performed in IBM SPSS v25. To evaluate inter-rater reliability we performed an intraclass correlation coefficient (ICC). The two groups were compared using Mann-Whitney U test and the level of significance was set at 0.05. Power analysis was performed in G\*Power with the cut off being at 0.8.

#### **Results**

The first part of the study proved the hip scoring tool to be reliable and we observed a significant difference between the junior and the senior registrars in the skill of templating.

#### **Conclusion**

Our X-ray based Hip Scoring Tool is reliable and can be used to measure the ability of surgeons to anticipate pitfalls and correctly predict intraoperative outcomes as they embark on Total Hip arthroplasty.



**Category:** Other

**ID:** 11201

## **Referral Patterns to Tertiary Center Shoulder and Elbow Orthopaedic Clinics**

**Paper/Poster:** Paper

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**Type:** no

### **Background**

The aim of this study was to evaluate referral patterns and quality of contents of referral letters received by orthopaedic shoulder and elbow units at two tertiary level hospitals.

### **Methods**

In this retrospective review, 120 referral letters received by the respective clinical units at Groote Schuur Hospital (n= 75) and Dr George Mukhari Academic Hospital (n=43) between February and July 2020 were evaluated. 7 referrals were excluded as they had no discernible author. Each referral letter was assessed using a 14-point scoring system developed by authors to define the quality of the content. This scoring system included basic administrative information and clinical data written by the referring health care provider on the referral letter. The profession and the rank of the referring personnel and level of referring facility were captured for comparative purposes. Each variable in the scoring system was binary (yes = 1 point, no = 0), and a composite score out of 14 was calculated for each referral. A letter was considered good quality if it scored 60% or higher.

### **Results**

Among all the referral letters evaluated, the majority were referred from public health care sectors (82%). The most common reason for referral was for diagnostic clarification and management (50%). The average referral letter content scored 62% (9 out of 14, SD 0,86). On average, letters from nursing staff conveyed the most information (71%) while letters from specialists conveyed the least information (50%). The differences in



scores between health care professionals were not statistically significant. The most common parameters included in referral letters were problem statement (96,5%); reason for referral (92,9%), and a provisional diagnosis (85,8%). Less than half of the referrals contained information on treatment provided to date (30,1%); relevant bloodwork (26.5%); impact on the patient's activities of daily living (24,8%); and current medication (15,9%). 86% of referral letters documented a provisional diagnosis.

**Conclusion**

This study has shown that most referral letters achieve an acceptable quality of content. Further research is required into the impact of referral letter quality on patient outcomes.



**Category:** General

**ID:** 11202

## **Return to Play Protocols for Musculoskeletal Upper and Lower Limb Injuries in Tackle-collision Team Sports: A Systematic Review of the Literature**

**Paper/Poster:** Paper

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**Type:** no

### **Submission:**

#### **Introduction**

Athletes in tackle-collision team sports are at high risk of musculoskeletal injuries resulting in absence from play due to the high impact nature of the sport. There is a paucity of research to guide the management and assessment methods needed to facilitate the return to play (RTP) process. This review aimed to describe, synthesise and evaluate RTP protocols implemented for musculoskeletal injuries in tackle-collision teams.

#### **Methods**

**Design:** A systematic review was conducted using Scopus, PubMed, Web of Science and Ebsco Host data sources.

**Eligibility criteria:** Observational and controlled studies investigating tackle-collision athletes who experienced upper or lower limb musculoskeletal injuries with interventions utilised during RTP involving either management strategies including rehabilitation or assessment modalities were included. The main outcome measures were the proportion of athletes to RTP, the associated time-loss and reinjury risk.

#### **Results**

5265 articles were screened. 34 studies met the eligibility criteria of which 23 involved management and 11 assessment modalities. Management involved surgical or conservative strategies along with exercise-based rehabilitation. Assessment modalities included radiographic assessment, clinical evaluation and subjective ratings. Promising RTP management included progressive weight-bearing and exercised-based rehabilitation for ankle sprains as well as surgery, the use of a sling and exercise-based rehabilitation for shoulder instability. MRI scans showed promise in predicting time-loss following hamstring and calf strains in tackle-collision athletes.

#### **Conclusion**

There are currently no clear guidelines for RTP after musculoskeletal injuries in tackle-collision sports. Future research should investigate efficient management strategies evaluated through valid and reliable assessment methods to better guide clinicians.



**Category:** Arthroplasty

**ID:** 11203

## **Extra-articular Deformities in Total Knee Arthroplasty: A Case Series**

**Paper/Poster:** Paper

**Presenter:** Mabua Chuene

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**Type:** yes

### **Submission:**

Total knee arthroplasty(TKA) is a successful procedure for pain relief and functional restoration in patients with advanced osteoarthritis. Advanced knee osteoarthritis may be complicated by a severe extra-articular deformity(EAD) emanating from either the femur or tibia. EAD may result from but not limited to trauma, congenital disorders, nutritional, metabolic and infective causes. The severity of such a deformity is the most important determinant of overall knee function and osteoarthritis progression. EAD presents a unique challenge in knee reconstructive procedures due to altered anatomical, mechanical axis and knee kinematics.

We undertook a retrospective chart review and outcome measure of TKA patients with EAD performed at our institution between January 2017 and March 2020. Ethics clearance was obtained.

We reviewed 11 cases TKA which were performed in the setting of an EAD. The case series was made up of 8(73%) females and 3(27%) males. The EAD arose from the tibia 9(82%) and femur 2(18.%) respectively. The aetiology of the EAD were previous trauma 10(90%) and Multiple Hereditary Exostosis 1(10%). All the cases were managed with one stage surgery with intraarticular bone cuts aided by computer navigation 3, EAD osteotomy and Smith & Nephew Navio robotic assisted plus stemmed implants 2, intraarticular bone cuts Smith & Nephew Navio assisted 2, EAD osteotomy plus conventional Jig based and stemmed implants 3 and one conventional jig based without EAD osteotomy. There was a single post operative complication, one patient sustained a peroneal nerve palsy. The short term(6-42month) patient knee score and functional score were all improved compared to preoperative scores.

We concluded that there are multiple modalities of performing TKA in the setting of EAD without compromising patient outcome



**Category:** Hands

**ID:** 11204

## **Positive Patient Experience of Wide Awake Local Anaesthesia No Tourniquet (WALANT) Hand Surgery in the Government Setting**

**Paper/Poster:** Paper

**Author :** Odette Koch

**Author Institute :** SAMHS

**Co-Author 1:** Jaco Naude

**Co-Author 2:** Wilhelm Schmidt

**Co-Author 3:** Theo Le Roux

**Type:** no

### **Submission:**

#### **Introduction**

The purpose of this study was to establish a subjective patient experience with WALANT procedures performed in the institution from May 2019 to March 2020. WALANT surgery was initiated to improve standard operating procedure and to decrease theatre burden.

#### **Methods**

This prospective, descriptive study included 100 patients with a mean age of 59 who required either a carpal tunnel or trigger finger release. Patient's pain experience was documented on the Visual Analogue Scale (VAS) for the local anaesthetic injection and the surgical procedure. Overall experience was assessed on the patient's preference to have the procedure performed by the WALANT method or the conventional method.

#### **Results**

One hundred patients were included, of which 67 had medical comorbidities. The mean VAS score was 1.5 (SD±1.6) with pain on injection. The mean VAS pain score during the surgical procedure was 0.2 (SD±0.7). One hundred per cent of patients (100/100) felt they would do the WALANT outpatient procedure again instead of admission to hospital and surgery in the theatre. Two complications occurred related to wound care problems which were successfully managed. None of the patients required reoperations for incomplete release of the carpal tunnel or trigger finger surgery.

#### **Conclusion**

The results of this study suggest that minor hand surgery using the WALANT protocol can be performed effectively and with high patient satisfaction rates in the orthopaedic outpatient clinic, and is a useful tool in the skillset of a hand surgeon.

Article submitted for publication.



**Category:** General

**ID:** 11144

## **Patient's Recall of Orthopaedic Procedure at Helen Joseph Hospital**

**Paper/Poster:** Poster

**Author :** Praval Dawadi

**Author Institute :** Dept. of Health, Gauteng

**Co-Author 1:** Abdirashid Aden

**Co-Author 1 Institute :** University of the Witwatersrand

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Informed consent is a pillar of medical ethics and is vital to patient autonomy. South Africa (SA) faces the burden of having a largely uneducated population together with limited access to health care facilities and professionals. This study aims to determine whether patients undergoing orthopaedic surgery at Helen Joseph Hospital (HJH) were informed when giving consent.

#### **Methods**

In this descriptive cross-sectional study, all patients who gave consent themselves for surgery were interviewed post-operatively in the wards prior to discharge. The recall rates for the surgical procedure and complications were recorded and analysed together with their demographic factors.

#### **Results**

This study showed that the recall rates of the surgical procedure performed were better than the recall rates of the complications, this was in keeping with international literature. Older patients, the less educated and the unemployed performed poorly compared to their counter parts. Patients who were consented by junior doctors also performed poorly.

#### **Conclusion**

The findings from our study show that patients at HJH who gave consent for surgery were generally not well informed. Our study reiterates international literature in that education is the most important factor in patient comprehension. Furthermore, our study highlights that junior doctors should not obtain informed consent prior to surgery.



**Category:** Infection

**ID:** 11146

## **Extrapulmonary Rifampicin Resistant Mycobacterium Tuberculosis (TB) of the Elbow Joint**

**Paper/Poster:** Poster

**Author :** Collen Sandile Nkosi

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Extrapulmonary Rifampicin resistant Mycobacterium Tuberculosis (TB) of the elbow joint is rare.

#### **Methods**

Case presentation: A 45 year old male patient who presented with a one week history of worsening pain, swelling and decreased range of motion of the left elbow joint. Initially, he presented three months ago with a painful elbow and was started on anti-inflammatory treatment then later referred to the orthopaedic surgery unit.

#### **Results**

He underwent incision and drainage where GeneXpert revealed Rifampicin resistant mycobacterium TB complex and Rifampicin resistant anti-TB treatment was started.

#### **Conclusion**

TB arthritis must be considered in the diagnosis of single joint arthritis in HIV positive patients with low CD4 count and Rifampicin resistant TB should be suspected.



**Category:** Other

**ID:** 11158

## **Contemporary Management of Aseptic Diaphyseal Tibia Non-unions – A Systematic Review**

**Paper/Poster:** Poster

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**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

Tibia fractures are the most common long bone injuries encountered in the trauma population. The majority are treated successfully but non-union remains a common complication. A systematic review of current evidence regarding the management for aseptic diaphyseal tibial non-unions was undertaken.

#### **Methods**

A systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA), was conducted.

#### **Results**

A total of 632 publications were screened for inclusion. Full text review of 91 studies resulted in 26 publications being retained for final review. The majority of patients included in the studies either underwent exchange nailing (n=315) or primary intramedullary nailing (n=174) with respective union rates of 88% and 95% being achieved. The highest union rate (97%) was achieved with the use of fine wire external fixation. The major adjuvant treatment modalities were fibula osteotomies (n=372; 41%), fixation dynamization (n=208; 23%) and bone grafting (n=183; 20%).

#### **Conclusion**

The lack of standardization in reporting of outcomes and the diversity of management strategies employed precludes definitive conclusions or recommendations. Further research is required to ascertain the ideal treatment strategy in the management of aseptic tibial diaphyseal non-unions.



**Category:** Hands

**ID:** 11170

## **Painless Flexor Tendon Rupture Secondary to Deep Non Suppurative Infection.**

**Paper/Poster:** Poster

**Presenter:** Thabiso Yende

**Presenter Institute :** Greys Hospital

**Author :** Sumeet Baitchu

**Author Institute :** Greys Hospital

**Type:** no

### **Submission:**

#### **Introduction**

An 85-year male presented with a 2week duration of painless swelling and inability to actively flex the index finger. He did not recall any injury or splinter to his hand. His co morbidities include atherosclerotic coronary disease, malignant melanoma and hypercholesterolemia. His complaints have affected his activities of daily livings. Examination revealed a fusiform swelling of the index finger extending to the palm of the hand. He had some erythema at the proximal interphalangeal joint with mild warmth, the swelling was boggy to palpation. He had no tenderness, unable to actively flex the metacarpophalangeal joint, proximal interphalangeal joint and distal interphalangeal joint. Passive flexion was not tender and was limited due to swelling. He had a well perfused finger and no sensory fallout.

#### **Methods**

After an initial assessment of tenosynovitis, he was taken to theatre for debridement. No fluid / pus was drained. He was discharged on oral antibiotics and occupational therapy. At 2 weeks follow up he had not shown any improvements. Ultrasound revealed a complex tenosynovitis. Under WALANT technique he had undergone an exploration and debridement in which findings were of a multinodular fibrotic tissue with areas caseation encasing flexor digitorum superficialis and profundus at zone 2/3. He was treated with 2 weeks of oral Flucloxacillin. After 6months post debridement he was taken for two stage reconstruction of profundus using palmaris longus graft.

#### **Results**

Specimens from second debridement revealed a bacterial culture of Staphylococcus Capitis sensitive to Cloxacillin, Erythromycin, Azithromycin and Clindamycin. Resistant to Penicillin. Histology revealed fibrous tissue with necrotizing and non-necrotizing granuloma. No acid-fast bacilli or fungi noted. All other specimens including Tuberculosis culture were negative. Repeat cultures at first stage showed no further growth. At final follow up he had full flexion of his fingers with good grasp strength but had residual extension contracture of 10°.

#### **Conclusion**

In this case we present a rupture of both flexor tendons to index finger secondary to a non-suppurative tenosynovitis caused by Staphylococcus Capitis. The patient had good outcome with extensive debridement appropriate antibiotics and two stage flexor tendon repairs.



**Category:** Arthroplasty

**ID:** 11192

## **Surgical Site Infections after Total Knee Arthroplasty - An Audit from 'Catch Up Arthroplasty' Weeks at Helen Joseph Hospital**

**Paper/Poster:** Poster

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### **Submission:**

#### **Introduction**

There is a paucity of literature on lower limb arthroplasty from local South African and Sub-Saharan African populations. South African State hospitals have demonstrated long elective lower limb arthroplasty waiting lists. To decrease these waiting times, Helen Joseph Hospital, a South African State hospital, has initiated 'catch up arthroplasty' weeks.

**Aim:** To perform an audit of the epidemiology and determine the prosthetic joint infection and superficial sepsis incidence rates in patients undergoing total knee arthroplasty during 'catch up arthroplasty' weeks at Helen Joseph Hospital.

#### **Methods**

One hundred and seventeen (117) patients' files from 'catch up arthroplasty' weeks at Helen Joseph Hospital were retrospectively reviewed. Biochemical, histological and microbiological results were retrieved via the National Health Laboratory Service database. Analysis was performed between patient variables (demographics, comorbid diseases etc.) and three outcome measures: prosthetic joint infection, superficial surgical site infection and overall post-operative surgical site infection. Prosthetic joint infection was defined using the 2018 revised Musculoskeletal Infection Society criteria.

#### **Results**

The average waiting time for total knee arthroplasty was 19.9 months. The average age was 64.4 years. Eighty three percent (83%) of the total knee arthroplasty procedures were performed on females. Osteoarthritis was the underlying diagnosis in 96.9% of cases. Type I obesity was the most common World Health Organisation body mass index category and 80% of the population was overweight. The average operative time was 106.4 minutes. The prosthetic joint infection incidence was 0.85%, and the superficial surgical infection incidence was 9.40%.



**Conclusion**

This was the first study to objectively determine a prosthetic joint infection incidence in Sub-Saharan Africa using validated criteria. The paucity of data from South Africa and Sub-Saharan Africa on audits of this kind demonstrates that more studies of this nature are needed to understand the differences in demographics and epidemiology of total joint arthroplasty populations and how these differences translate into risks for post-operative infective outcomes in our region.



**Category:** Foot & Ankle

**ID:** 11193

## **Treatment of Unstable Weber C Ankle Fractures in Adults with a Locked Intramedullary Fibula Nail: Long-term Follow Up**

**Paper/Poster:** Poster

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**Author Institute :** Dept of Health Western Cape

**Type:** REGISTRAR

### **Submission:**

#### **Introduction**

The gold standard for fixation of unstable ankle fractures is open reduction and internal fixation with plate and screws. This method does, however, have risks of wound complications and hardware irritation. As a result, the intramedullary fibular nail for fixation of lateral malleolus fractures was introduced. When compared to fibular plating in medical literature, it is reported to have significantly lower rates of wound complications and better functional outcome scores. There is, however, limited information on the long-term outcomes of patients treated with fibular nailing. This study aimed to investigate i) functional and clinical outcomes and ii) ankle range of motion of patients treated with the intramedullary fibular nail at 5-years post-surgery compared to 3-months post-surgery.

#### **Methods**

All adult patients (n=20) previously treated with intramedullary fibular nailing for unstable Weber C ankle fractures between 2013 and 2014 were considered for inclusion. Radiographs of the ankle (anteroposterior, lateral and mortise views) were taken and assessed. Range of motion of the affected ankle was measured and compared to the opposite side. The patients' functional outcome score was evaluated using the Olerud and Molander functional scoring system.

#### **Results**

Fifteen patients were included in this study (11 male, 4 female, mean age 34 +/- 11 years). The functional outcome score seen at 3 months post-surgery was maintained at 5 years (90 (interquartile range 65-100) (p=0.576). Ankle range of motion (dorsiflexion and plantarflexion) was still similar between the affected and unaffected ankle at 5 years post-surgery (Plantarflexion: p = 0.415; dorsiflexion: p = 0.295) Three patients (20%) had ankle osteoarthritis at 5 years follow-up (p=0.224).

#### **Conclusion**

The good functional and clinical results seen at 3 months post-surgery was maintained at 5 years follow-up. Intramedullary fibular nailing is thus a viable treatment option for unstable Weber C ankle fractures in young adults with proven good long-term results.